

Final Report

Evaluation of the Low Income CFL Program in North and South Carolina

Results of a Process Evaluation

**Prepared for
Duke Energy**

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Executive Summary

Program Description

The Low Income CFL program offers a free 12-pack of Compact Fluorescent Light bulbs (CFLs) to low income customers who complete a survey provided through Duke Energy's Agency Assistance Portal, herein referred to as the "Portal". The Portal is a web-based access point that allows the staff of low income service agencies to access Duke Energy's customer account information while providing social support services to their clients. The Energy Efficiency survey can be completed online through the Portal by an agency staff person for each low income customer while the customer is visiting the low income agency. The survey can be completed only once per Duke Energy account number in a 36-month period. After the survey is submitted through the Portal, Duke Energy mails the customer a 12-pack of free CFLs and pays the agency \$1.00 for each completed survey.

While the survey is submitted online through the Portal, some agencies have paper copies of the survey that are filled out (by hand) during the customer's visit to the agency. Then, the survey data is entered into the Portal by agency staff at a more convenient time after the client's service-visit is completed. The paper version of the survey can be found in Appendix C: Energy Efficiency Surveys). This document contains the same questions as the survey on Duke Energy's Portal.

Summary of Findings

This Executive Summary provides an overview of the key findings identified through this evaluation.

Significant Process Evaluation Findings

- Duke Energy is not meeting its participation goals for the Low Income CFL Program. Duke Energy would like to increase participation and the subsequent Save-A-Watt (SAW) impacts through the Low Income CFL Program or other Low Income Programs. However, operational pressures, limited staff, low operating budgets, increased service demand from low income service agencies, and ARRA fund compliance will continue to limit participation achieved through the agencies.
- Agencies serving low income clients in North and South Carolina have varying levels of capacity available. Some agencies do not have the time and/or staff resources to take the time to go through the Portal's survey with their clients, and could not identify a way for Duke Energy to help them with this problem outside of Duke Energy staff being present in the waiting rooms to offer the survey. Other agencies could likely increase the number of Energy Efficiency Surveys completed if they were provided with printed client motivation materials, such as posters to put up in the agency and printed surveys that can be mailed in by the client.

- While several agencies do not have the time to use the Portal, all of the visited agencies were very satisfied with availability and operations of the Portal, and the web-based method for submitting the Energy Efficiency Survey results. None of the visiting agencies had serious issues with the Portal.
- Many of the agency staff providing the low income services are not seeing or not reading the Duke Energy e-mail “encouragement” marketing efforts aimed at promoting the use of the Portal and the distribution of the CFLs via the survey approach.

Recommendations

The following recommendations are based on interviews with staff in low income agency offices and with the program manager at Duke Energy.

- **Issue 1:** Duke Energy is currently offering only one of the three planned low income programs in North and South Carolina, the CFL Program. The Weatherization and Refrigerator Replacement Programs have not been launched.

Duke Energy has not launched these two low income programs because there are large pools of unspent federal funds for weatherization services currently available from the American Recovery and Reinvestment Act. Service agencies are under pressure to spend these funds over the next two years and spending goals are behind federal objectives for rapid deployment of federal weatherization services. Duke Energy does not want to compete against the federal government for limited implementation services or complicate the operations of the low income and/or weatherization agencies with dual funding streams, dual approved measure lists, dual reporting requirements and different weatherization program goals.

Recommendation 1: Instead of delaying the launch of these programs indefinitely, Duke Energy should contact the low income agencies and investigate ways that Duke Energy can provide their low income customers with measures and services to reduce their energy consumption without causing the low income agencies unnecessary operational difficulties. For example, Duke Energy can fund measures that are cost effective, while federal funds can be spent on longer lasting, less cost effective measures. However, finding weatherization service providers who are receptive to this dual funding, dual measure assessment approach may be difficult until the agencies can catch up with their federal spending objectives and energy goals. As ARRA funds available to the service providers near exhaustion, Duke Energy will find that these agencies will need to find additional funding streams or terminate hired staff. Over the next 12-16 months Duke Energy will find local service agencies becoming more interested in providing services funded by Duke Energy. However, at this time agencies are focused on spending the ARRA dollars and finding enough staff and clients to meet their spending goals. Agencies not affiliated with ARRA (weatherization,

state energy programs, and block grant initiatives) and the traditional federal weatherization initiatives remain prime targets for negotiating service agreements for their clients to the extent that these clients are not serviced by other weatherization providers.

- **Issue 2:** The \$1 to cover the increased costs and time needed to complete the survey is, in most cases, not enough to cover costs.

Recommendation 2: An increase in submitted surveys would require either higher payments to be made by Duke Energy or an alternative incentive structure, combined with marketing material support for the agencies. In addition, many agencies that do provide the surveys are not aware of ever receiving a Duke Energy incentive check for their efforts since the checks are sent to a different office in their organization. Thus, the people conducting the surveys with their clients are often not aware that their agency benefits from that effort. To most agencies, the only known incentive offered for participation in the Low Income CFL program is the free 12-pack of CFLs mailed to the low income client. Duke Energy should examine the incentive and marketing support operations to determine if there is enough cost-effectiveness in the initiative to provide marketing support and agency compensation to cover costs and help reach survey completion objectives.

- **Issue 3:** Not all of the low income service agencies are interested in offering the survey.

Recommendation 3: Each of the offices that have access to the Portal should be asked if they would like to offer the surveys to their clients in exchange for an incentive from Duke Energy. Market the financial support to customers and agencies by sending a Duke Energy speaker to events geared to low income service providers that includes talking point slides to managers at agency offices so that support comes from both top down and bottom up.

If the low income agency is interested in participating and providing the surveys to its clients:

- Encourage participating offices to make the Energy Efficiency Survey a part of their client intake process.
- Posters marketing the survey and free CFLs (and their energy and bill savings benefits) for their waiting areas should be considered by Duke Energy.
- Paper copies of the surveys should be provided by Duke Energy for the case workers and for the clients to take home in case they do not have or do not know their account number. Postage paid envelopes were suggested, but other offices have said that they are not necessary as most clients are willing to pay for postage to get the free CFLs, or will bring the survey back to the office during their next visit.

- Encourage the low income agency offices to distribute paper copies of the survey throughout all offices that serve low income clients.

If the office is not interested in providing the Energy Efficiency Survey to their clients, there is no need to send paper copies of the survey or promotional materials. If an office does not want to offer the Energy Efficiency Survey, it is likely because they do not have the time and staff resources to administer the survey or they have a low percentage of clients that live within Duke Energy's service territory. Therefore, survey and promotional materials will likely be discarded and may negatively affect the relationship between that office and Duke Energy.

- **Issue 4:** Agency staff are not always reading the emails from Duke Energy, so they may not be aware of program changes, issues, etc.

Recommendation 4: Continue other approaches in addition to e-mail marketing to the service providers. Continue direct marketing of the program to service agencies via personal visits and "sales calls" and move away from relying on the use of e-mail promotional efforts as the primary "encouragement" approach or specifically target those efforts at the staff that provide the interaction-based service with the client. Consider hard-copy mailings or "encouragement" pieces, direct telephone calls with provider agency staff, personal visits with provider agencies, and alternative incentive mechanisms that cover the cost of providing the service. Consider the use of spiffs or bonus rewards to staff who submit a targeted number of surveys.

- **Issue 5:** The Energy Efficiency Survey is collecting demographic and home profile data that should be incorporated into analyses, such as insights into Low Income customers, cross selling, target market modeling, and marketing message testing being performed by Duke Energy. However, this data is not being analyzed at this time.

Recommendation 5: The data collected through the Energy Efficiency Survey should be incorporated into analyses being performed by Duke Energy to identify the best products and services for Duke Energy's low income customers and to identify homes that have the highest energy savings potential. Data should be integrated in the same database systems (accessed via SQL Server) as home profile data being collected through other Duke Energy programs such as Personalized Energy Report, Online Audit, and Home Energy Comparison Report Pilot.

- **Issue 6:** Duke Energy has recently rolled out a new IVR (Interactive Voice Response) and web-based CFL program that does not include a survey but allows the customer to click a button for a free CFL. This presents a possibility for program overlap as low income customers may obtain the free CFL without completing the Energy Efficiency Survey, or in addition to completing the Energy

Efficiency Survey and obtaining the 12 free CFLs. Another potential point of overlap is in the targeted reach of the Home Energy Comparison Reports (HECR), where approximately 10% of HECR customers meet the poverty level requirement.

Recommendation 6: Duke Energy should monitor for program overlap between these programs. TecMarket Works does not expect there to be significant overlap between the Low Income and IVR programs unless there's a process in place that sends the low income customer to the IVR web program for the free CFL. Significant levels of overlap are not expected because low income customers are less likely to explore non-low-income services on their energy providers website. However, it's possible that these multiple points of potential contact through these multiple programs could provide additional synergy and savings beyond what the programs deliver independently. Duke Energy should track this possible effect and consider how to best attribute programmatic savings.

Introduction

This report presents the results of a process evaluation of the Low Income CFL Program in North and South Carolina. This evaluation was conducted to examine the reasons for varying participation rates in the CFL Program across low income agencies in North and South Carolina. TecMarket Works visited ten randomly selected low income agencies to determine what was working for those agencies that were recruiting high numbers of visiting clients to take the survey and thereby participate in the Low Income CFL Program, and to talk to the agencies with low participation rates about how Duke Energy could possibly help them to recruit more of their clients into the program.

Evaluation Methodology

This effort employed twelve in-depth interviews with directors, social workers, and staff of offices that participate in the Low Income CFL program. The 10 visited low income agencies were selected randomly from the full population of 50 participating low income agency offices throughout Duke Energy's territory in North and South Carolina. Interviewees were contacted by phone to set up an onsite interview at their office at their convenience.

Low Income Agency Process Evaluation Results

TecMarket Works visited ten low income agencies in North and South Carolina to conduct on-site interviews with agency staff regarding the Low Income CFL program by Duke Energy and offered through the low income agencies. The results of these interviews and the interview with the program manager at Duke Energy are presented in this section.

The Agency Assistance Portal

The Agency Assistance Portal (the Portal) is a tool on Duke Energy's web site that allows low income agency staff access to view the Duke Energy customer's account information. This access provides the low income service provider with the ability to make payments to the customer's account on behalf of the customer, and to complete a short customer survey about their home. After this survey is completed and submitted through the Portal, the following occurs:

- The low income service provider receives \$1 for each completed survey submitted by that agency. The incentive check is sent to the participating low income agencies (or their headquarters office) twice a year by Duke Energy.
- The customer's housing information collected through the survey is sent to Duke Energy. This survey (that also triggers distribution of 12 free CFLs) can be found in Appendix C: Energy Efficiency Surveys.
- The low income customer that completed the survey in the agency's office receives a kit containing 12 free CFLs through the US Mail.

Duke Energy then takes credit for the energy savings associated with the installation and use of those bulbs. The program will undergo an impact evaluation in late 2010 to document savings achieved.¹

The primary CFL delivery approach for this program is the use of Duke Energy's Agency Assistance Portal. The low income customers receive a kit containing free CFLs for completing a short survey about their home while they are in the low income agency's office. However, the customers may not be aware of the opportunity for the free CFLs if their case manager (or other low income agency staff person) does not inform them of the survey on the Portal (this is a common experience).

According to the program manager, promoting the use of the Portal to local low income service providers has not been as successful as the Duke Energy managers had hoped. Duke Energy's primary mode of communication with the agencies is via e-mail notices. However, managers at the agencies do not always read the emails sent to them by Duke Energy which advises them of the existence of the Portal and encourages them to use the Portal so that more efficient processing of payments to the customers' accounts can provide immediate help to their clients.

¹ The impact evaluation for this program was canceled.

While e-mail is the primary method of pushing the program, Duke Energy managers have also visited some of the low income agencies to promote the Portal and ask questions about the features of the Portal, and have offered workshops in various locations throughout their service territory in North and South Carolinas to encourage the agencies to use the Portal and offer the survey to their clients.

According to Duke Energy managers, the use of the Portal would reduce Duke Energy's Low Income program operational costs by decreasing calls to Duke Energy from low income agencies that would like to post payments in the form of agency commitments to their clients' accounts.

TecMarket Works visited the offices of ten agencies in North and South Carolina that use the Portal, and found that all report very high satisfaction with the Portal. These users reported that there were some minor communication and system access problems with the operations of the Portal. However these problems were remedied quickly after Duke Energy learned of the problems.

Unfortunately, many of the low income service providers have only a few minutes with each client and each second needs to be productive in delivering a set of services to that client. The user agencies report that the Portal has increased their efficiency in addressing their client's account issues and in posting payments to accounts. However, the increase in efficiency does not allow them the additional time needed to complete the survey. They view the increased efficiencies brought to them by the Portal as a way of meeting with more of the increased number of clients that are in their waiting rooms rather than expanding the service offering to each client. As a result, in many cases the Energy Efficiency Survey is uncompleted by some agencies.

The only Portal design issue reported by some of the agencies was that they would like to have access to their client's account information even if the client's account has been disconnected, as having access to the client's billing and payment history would still be helpful to them.

Offering the Portal's Energy Efficiency Survey to Clients

Most of the agencies interviewed did not have a formal process for offering their clients the Energy Efficiency Survey embedded within their service delivery or operational protocols. Out of ten offices visited, only two offer the Duke Energy survey to every visiting low income client. Three offices *never* offer the survey, mostly because of the lack of time and available resources within the office. Four offices offer the survey only if the client is coming in for an energy-related issue that prompts them to enter Duke Energy's Portal.

	Number of Offices (out of 10)
Offers the Survey if Client is visiting for an energy crisis or issue	4
Does not offer the Survey	3
Offers the Survey to Every Eligible Client	2

Offers the Survey to Clients if they have time (i.e., no other clients waiting for service)	1
---------------------------------------------------------------------------------------------	---

One office that offers the survey to every eligible² client makes the survey a part of their intake process for clients visiting the Department of Social Services (DSS) office. All case workers in this office have paper copies of the survey, and they offer it to all low income clients regardless of the reason for the visit. Figure 1 is a photo of a case worker's office, where the Duke Energy surveys are prominently displayed.

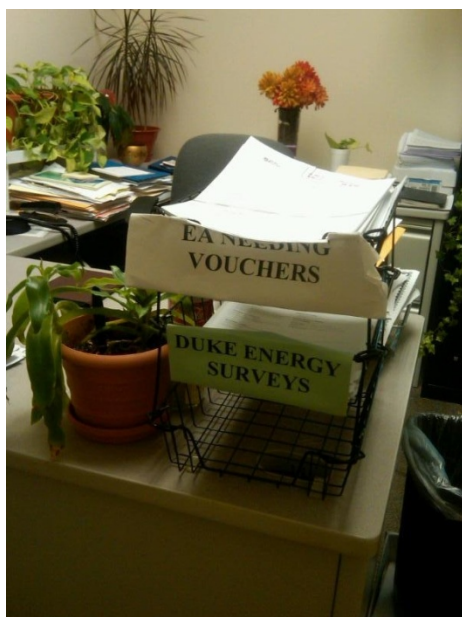


Figure 1. Office of Greensboro, NC DSS Staff

One agency office that offers the survey only to visiting clients that have an energy-related issue will also complete the survey with clients that specifically ask to complete the survey (but do not have an energy-related issue). The client asking for the survey is likely prompted by seeing one of the agency-developed program-related signs that are displayed in the waiting areas and hallways. The sign is shown in Figure 2. This sign was created by staff at this particular DSS office, and printed on site at the DSS office. These signs were prominently displayed throughout the waiting area and hallways, but they do not mention the energy savings or lower electric bills that would result from the installation and use of the free CFLs.

If the low income agencies would agree to complete the survey with the visiting clients that specifically ask to complete the survey no matter what their reason for visiting the agency, Duke Energy should design, print, and distribute signs that these agencies could post in their waiting rooms, hallways, and offices.

² Eligible in that they are a Duke Energy customer.

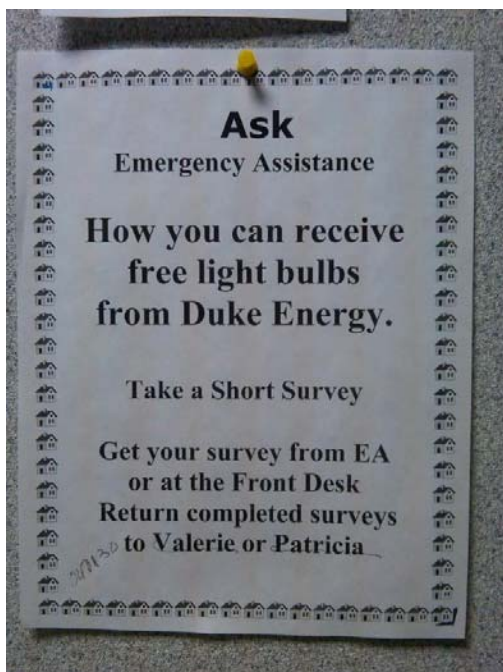


Figure 2. Sign at Rockingham County NC DSS Office

The two DSS offices with these processes in place (one with posted signs promoting the survey, the other with printed surveys prominently displayed in their offices) have high numbers of completed surveys relative to the other offices that do not promote the program or the survey in these ways.

Increasing Energy Efficiency Survey Response Rate

Duke Energy would like to see the number of Energy Efficiency Survey responses increased through this program. During the process evaluation interviews with low income agency staff, TecMarket Works asked for ideas about ways that Duke Energy could help their office to increase the Energy Efficiency Survey completion rate.

The following is a list of suggestions for increasing the number of surveys completed. These suggestions were all provided by the staff at the visited offices.

- "Distribute printed surveys to other offices in the DSS buildings (such as Human Services) so that more service providers can offer the survey to obtain the bulbs."
- "Duke Energy could send a staff person to hand out the surveys in the waiting area."
- "Duke Energy could supply envelopes addressed (postage paid preferred) to the DSS office so that clients could take them home to complete and send back to the DSS office for entry into the Portal."
- "Encourage (possibly with incentives to the agency) offices to make the survey a part of their sign-in process."

- "With the increase of first-time clients needing assistance, we have put together a referral packet with resources and information. If there were paper copies of the survey, we could include it in this packet."
- "Make the survey a part of the client intake process for all clients."
- "Some clients won't complete the survey because they are in a hurry. If we had paper copies, we could let them take it with them."
- "Give weatherization providers access to the Portal and the survey."
- "Allow one or two questions on the survey to go unanswered. If one question is left unanswered, the survey won't be complete and the client won't get the CFLs."
- "Some offices have a weatherization person in the lobby talking to waiting clients and it's possible that they are willing to offer the survey (if there were paper copies available)."
- "Allow for case workers to enter surveys using the address instead of an account number. That way, if a client does not have their bill, the survey can still be completed."³
- "Provide paper copies of the survey in waiting rooms so that the surveys can be taken home and brought back during their next visit or mailed back to the office."

Increasing the Number of CFLs Installed

TecMarket Works also asked the agency staff for ideas for increasing the number of CFLs installed by their low income clients. The following is a list of suggestions for increasing the number of CFLs installed. These suggestions were all provided by the staff at the visited offices.

- "Distribute CFLs to foster homes in the Duke Energy territory."
- "Every few months, Duke Energy can hold a seminar that are accessible to the public where Duke Energy can explain what is available to the clients. Poster the DSS offices, and clients can go if they are interested."
- "Provide an educational pamphlet on the savings that can be achieved by using the CFLs in high-use areas."
- "Provide CFLs directly to the weatherization providers who will install the CFLs. Most providers already do this, but they likely purchase the CFLs using Weatherization and ARRA funds."

Program Materials

There are no program materials for the Duke Energy Low Income CFL program. The agencies are left to print out the survey if they want to complete them on paper or hand them out to visiting clients. The Portal is the primary method of gathering the data from the survey, and most offices that are already using the Portal will complete the survey while logged in. However, paper copies of the survey may be useful as the offices that did print paper copies generally have higher survey completion rates.

³ This is possible if the agency staff has access to (and knows about) the Duke Energy Third-Party Search Tool that will allow the user to look up an account number using the client's address or other information. Most agencies have access to this search tool, but may not be aware of its existence.

Signs promoting the free CFLs and benefits of using the CFLs that the offices can display in their waiting areas and/or hallways may increase customer interest in completing the survey to obtain the free CFLs.

Problems That Have Come Up

There are few problems with the program operations reported by offices that use the Portal. The agencies like the Portal and find it easy to access and very user-friendly. However, there are issues that can be addressed which may increase the number of surveys completed. The following suggestions were mentioned by interviewed agency staff more than once.

- It would be helpful to have promotional materials for the program. Printed materials such as fliers, posters, and paper surveys would allow the client to ask for the survey if they are interested in the CFLs. As it is now, most agencies leave it to their staff to offer the survey to the client.
- Allowing the survey to be completed using the customer address or other identifier. Clients may want to complete the survey to get the CFLs, but can't complete it because they do not have a bill with them during their visit, and their account number is needed for the agency staff to access the Portal and the survey.
- Illegal immigrants with children are eligible for low income services, but they do not have a social security number. In many cases they will provide a fake social security number when they sign up for their Duke Energy accounts and then they do not remember the number they provided, which in turn results in the agency not having the ability to gain access to the client's information or survey through the Portal. This would also be remedied by the ability to log into the client's account information using an address and/or other identifier the client would likely have memorized.
- One agency reported that their clients did not receive CFL kits, but instead received coupons for CFLs in the mail. This presents a barrier to the client in getting the CFLs because it leaves the recipient with an extra step in obtaining the CFLs. The low income customer may not use the coupon to get the free CFLs, and that in turn is a barrier to the increased installation of CFLs in their homes.

Wait Time for Incentive

Duke Energy provides the low income agencies with \$1.00 for each completed Energy Efficiency Survey. However, only one agency was aware of the check being sent to them from Duke Energy. This office was aware that the check came in because they had already agreed to use the money to fund a new ice machine for the office. This office was satisfied with the time it took to get the incentive check from Duke Energy.

All of the other interviewed agency staff were not aware of a Duke Energy incentive for completing surveys, and indicated that they probably would not be made aware of the check incentive as it would be sent to their accounting office, and would likely be deposited into a general fund and not identified as funds received because of the time they spent completing the Energy Efficiency Surveys.

Agency staff had different opinions about the amount of the incentive. One dollar was seen by some as marginally sufficient, others as barely enough to cover the time it took to complete the survey.

Duke Energy's payment of \$1 to compensate for increased operational costs to complete the survey is insufficient to cover the time needed to provide the survey for most agencies. Many agencies are focused on helping each client receive the immediate assistance they need as soon as possible so that they can move on to the next person sitting in the waiting room. This condition of needing to rapidly move through the service delivery process and move on to the next client, and the fact that the people that are in the position to offer the survey are typically not aware of the incentive, provides minimal inducements for the staff to address Duke Energy's programs needs or requirements.

A different incentive structure should be considered by Duke Energy to compensate the low income agencies and staff for their time and efforts. Duke Energy should consider sending a brief survey to the low income service providers about which type of compensation would work best for their office and/or staff to motivate them to complete the Energy Efficiency Survey with their clients. Some possibilities include direct incentives to staff people that complete the survey ("spiffs"), or money to the agency so that they can continue their work serving the low-income community.

What About the Low Income CFL Program Works Well

Interviewed agency staff report that the Energy Efficiency Survey is easy to access and complete through the Portal. Almost all users of the Portal think that the Portal works very well and appreciate the functionality and options available to them through the use of the Portal. However, for many offices, the Portal does not increase their efficiency with their clients enough to allow them time to offer the survey to their visiting clients. There are almost always other clients waiting to be seen. As a result the agency staff feels rushed to move on to the next client, unaware of the incentive or lacking a procedural instruction to process the survey. Likewise, clients who are there for non-energy related services (food, housing, etc.) typically are not encouraged to complete the survey or enter the Portal.

Communications with Duke Energy Staff

According to the agency staff interviewed for this evaluation, Duke Energy has a very fast response rate when issues or questions arise, and Duke Energy staff is always helpful and courteous.

What Should Change About the Low Income CFL Program

Some of the agencies reported that they would like to be able to find a client's information on the Portal (and then possibly offer the Energy Efficiency Survey) by using the client's address instead of their account number. This may help to increase the number of surveys completed by allowing the agency to access the Portal when the client is in the agency office but does not have a Duke Energy bill with them to give the agency staff person their account number.

A few agencies reported that they would like for the survey to allow one or two questions to go unanswered on the survey and have it be submitted as complete. As a result of human error due to interruptions or a client refusing to answer a question, the survey can't be submitted and the client will not receive the CFLs through the program. The survey can have mandatory questions and non-mandatory questions that are transparent to the client, but allow the survey to be processed and for savings to be counted when non-mandatory questions are missed.

Broadening the Scope of the Program

The following suggestions are outside of the current scope of the CFL Program, but were offered as suggestions for changes to the program.

- Some of the low income agencies would like to have a list of weatherization service providers in their area to give to visiting clients.
- Some agencies expressed interest in offering high-efficiency appliances to their clients when they are in need of replacement appliances, as some jurisdictions do not require landlords to supply appliances with their rental properties. These agencies, like the agency in Wentworth, NC, are consistently looking for appliances to provide to their clients.
- Another suggestion was to offer other measures in addition to CFLs in the kit sent to the clients for completing the survey. A few agencies reported that their clients would use other measures such as low-flow showerheads, faucet aerators, and weather stripping, if installation and use rates are high enough to justify the addition.

Customer Awareness of the Low Income CFL Program

TecMarket Works did not survey low income customers about their awareness of the CFL Program. However, interviews with agency staff indicate that there is a low level of awareness given that low income customers need to learn of the program through the low income agency that in many cases, will not offer the program's survey to them. Awareness could be increased through the distribution of promotional and survey materials to the interested agencies, as discussed elsewhere in this report, or inclusion of program referral materials inserted into the low income customers' bills.

Why Low Income Agencies Participate

The agencies all agree that this is a good program that provides their low income clients with free CFLs that will help them reduce their electric bill. The agencies would like to do everything they can to help their clients. However, many of the low income agencies do not have time to complete the survey, or to check to see if the client is a Duke Energy customer unless the client is there for an energy-related crisis. The need to help clients drives participation but falls short of comprehensive engagement on the part of the service providers.

Appendix A: Low Income Agency Interview Instrument

Title: _____

Responsibilities associated with the Low Income Program:

Note: check the box next to each question that needs to be addressed by each interviewee.

Program Accomplishments and Objectives

- ☐ Using your experience and knowledge about the Low Income Program, please finish the rest of the following statement. I think this program can be viewed as a success if it accomplished the following things....
 - 1.
 - 2.
 - 3.
- ☐ How well do you think the Low Income Program accomplishes each of these things?

Customer Recruitment and Retention

- ☐ What are the various ways in which participants are identified, contacted and offered the program. Please describe each of the ways customers were identified, contacted and enrolled in the program.
- ☐ What aspects of this process worked well? Which worked least well? Why?
- ☐ What system for identification, notification and enrollment do you think should be used in order to obtain participants and accomplish Duke Energy's program goals? Discuss how these might work.
- ☐ Are there any screening tests used to make sure the right customers are enrolled in the Duke Energy's Low income programs? Please explain how the screening process works. Walk through some different examples of how this works. In your opinion, how well did this work? Why? Are any changes needed to the screening process?
- ☐ What are the main reasons customers have for not wanting to participate?
- ☐ What kinds of things can be done to overcome this resistance?

- What percent of qualified clients actually enroll?

Drop-outs

- Why do you think some of the program participants that were offered the program choose to not take advantage of it?
- What can be done no decrease the program drop-out rate and keep them involved?
- What can be done to increase the dropout's interest in staying in and receiving the weatherization service or refrigerator replacement?

Program Process

- What complaints or customer issues have you experience with Duke Energy's Low Income Programs? How were these handled?
- What can be done to help solve (complaint 1 / complaint 2 / complaint 3 / etc.)?
- I would like you to tell me about the customer's experiences with the program. What kinds of things did they like, what kinds of things did they dislike, and how do you think they feel about the program overall?

Program Management and Communication

- Describe the process used for obtaining weatherization and/or refrigerator applications from program participants and getting the applications into the weatherization/refrigerator planning stream.
- How well does this process work? Are there any problems in getting the applications to the people responsible for providing the weatherization/refrigerator? How can this process be improved?
- Were there any participant tracking, accounting or processing problems or issues associated with tracking, timing and delivering services? What are they and how can these be avoided in the future?
- What other types of management or participant issues have come up and what were their resolutions, or what still needs to be done?
- If you could change one thing about this Program, what would it be? Why? Are there any other things that you would change? Why?

- When you look at the help that this programs provides to participants, and weigh the program costs and operational challenges, would you say that the benefits are worth the effort for the clients, for your agency, for Duke Energy? Why?
- What are the benefits to the client, to your agency, and to Duke Energy?
- Now I want to ask you about Duke Energy's ratepayers who are ultimately responsible for funding the Low Income Program. What are the benefits that the program provides to all of Duke Energy's ratepayers? What benefits are the ratepayers who pay for this service receiving?

Appendix B: Second Refrigerators

TecMarket Works conducted a literature and data review to estimate the market potential for a low income program aimed at removing second refrigerators from homes.

To gather information about the prevalence of second refrigerators, the results from the 2005 Residential Energy Consumption Survey (RECS), found on the U.S. Energy Information Administration website for independent statistics and analysis, were used. RECS is a national area-probability sample survey that collects energy-related data for occupied primary housing units. In 2005, 4,381 households in housing units statistically selected to represent the 111.1 million United States homes participated in the survey. Because it is a sample and every home in the country was not surveyed, all data is extrapolated and, consequently, approximate.

Regional data was available for the four census regions, Northeast, Midwest, South, and West, but unfortunately not for individual states. The overall data is as follows: Out of the 111.1 million homes across the United States, approximately 24.6 million (22%) have a second refrigerator.

- 22.5 million (92%) of these residences are owned.
- 23.1 million (94%) of these residences are single family homes.
- 1.5 million (6%) of these households are below the poverty line and 4.5 million (18%) are eligible for federal assistance while 9 million (37%) have a household income greater than \$80,000.
- 7.8 million (32%) of these residences are in cities, 6.5 million (26%) are in the suburbs, 6 million (24%) are in rural areas, and 4.3 million (18%) are in towns.
- 16.1 million (65%) second refrigerators are top-and-bottom or side-by-side two door models, 2.8 million (11%) are full-size one door models, and 5.1 million (21%) are half size.
- 12.7 million (52%) second refrigerators are over ten years old; 4.1 million (17%) are over twenty.
- 7 million (28%) second refrigerators are small or very small units, 10.5 million (43%) are medium sized, and 7.2 million (29%) are large or very large.

A study performed by Progress Energy Carolinas, Inc. (PEC) shows that thirteen percent of their customer base owns two or more refrigerators, a number considerably smaller than the twenty-two percent estimated by the RECS. PEC and RECS both found second refrigerators to be most common in single family homes, however they once again report drastically different numbers: 63% and 94% respectively. An added dimension in the PEC study that was not present in the RECS is the location of the second refrigerator. They revealed that 58% of customers having two or more refrigerators use one in their garage or basement.

The U.S. Department of Energy published a Refrigerator Market Profile in 2009. The DOE statistics show that twenty-six percent of all U.S. homes have two or more refrigerators, similar to the twenty-two percent found with the RECS, and that this number is growing at a rate of about one percent per year. Over half of these second refrigerators are more than ten years old. Twenty-seven million inefficient units manufactured before 1993 are still in use. This is because forty-four percent of refrigerators that could be retired are kept as second refrigerators, sold, or given away and thus stay on the grid instead. Also, sadly, only thirty percent of refrigerators sold are ENERGY STAR qualified.

Energy Trust of Oregon has a program called the Refrigerator Recycling Program that they implemented in 2008. With help from JACO, they collected data for one year of program operation. This data is of limited usefulness, unfortunately, because the data is of course only from those households that were recycling refrigerators, and not from all households. From June 2008 to June 2009, they removed 5,563 refrigerators 1,952 of these were secondary units (46%). JACO also asked homeowners if the unit being disposed of was or will be replaced; sixty-four percent of refrigerators were replaced. Disappointingly, there is no data available on how many of these were secondary versus primary refrigerators. We do know that seventy-two percent were replaced with new refrigerators, meaning that twenty-eight percent of the people are still replacing their recycled refrigerators with used models.

The World Economic Forum, in partnership with IHS Cambridge Energy Research Associates, recently published their Energy Vision Update 2010. The report is very vague and contains no numerical evidence, but states that today's refrigerators, despite being twenty percent larger than in 1975, cost sixty percent less in inflation adjusted terms and uses three-quarters less energy. They go on to say that consumers are robbing the U.S. of the energy savings provided by efficiency improvements because the number of secondary refrigerators is ever increasing as people upgrade their kitchen refrigerators and move the old ones to their garages or basements.

In a report prepared by Kema-XENERGY for the California Energy Commission, second refrigerator saturation data for the state of California recorded as follows: Out of the 21,252 homes surveyed, 3,957 (19%) have a second refrigerator.

- 3,456 out of 13,824 (25%) single family homes have a second refrigerator.
- 196 out of 1,780 (11%) town homes have a second refrigerator.
- 73 out of 563 (13%) mobile homes have a second refrigerator.
- 96 out of 1,608 (6%) two to four unit apartments have a second refrigerator.
- 135 out of 3,377 (4%) five or more unit apartments have a second refrigerator.
- 265 out of 1393 (24%) new homes have a second refrigerator
- 3,359 out of 19,760 (17%) old homes have a second refrigerator

It is also interesting to note that other sources I have found simply state that secondary refrigerators have a higher energy consumption. This report, however, states that this is true for all but multi-family homes where their energy consumption is slightly less because secondary units may be very small.

In 2005 Natural Resources Canada published their Survey of Household Energy Use. This is of course for Canada and not the U.S. but it still seems at least somewhat applicable. This report says that the proportion of main refrigerators with large or very large capacity has increased from forty-nine to sixty-seven percent in the last decade. It follows, then, that the capacity of secondary units would also be increasing. In the same decade, the proportion of secondary refrigerators with large or very large capacity has increased from twenty-three to thirty-five percent. This is most likely because, as was mentioned before, people will hold onto their old refrigerator when they replace it and put it in their garage or basement to use as a secondary refrigerator. Also as a result of this, the percent of households with a secondary refrigerator has increased from twenty-five to thirty-six percent over the same time period. The average age of a main refrigerator is 9.6 years while the average age for a secondary unit is 17.9 years. Also note, though, that with this increase in refrigerator size has come a decline in the penetration rate for freezers which are down to sixty-nine percent from seventy-five. Households seem to be slowly replacing freezers with additional and larger refrigerators, which include freezer sections.

Appendix C: Energy Efficiency Surveys

ENERGY EFFICIENCY SURVEY QUESTIONS – RENTER



Duke Energy thanks you and our customers for taking the time to complete this survey. We will keep your answers to these questions confidential. We will use this information to learn from our customers, develop new ways to better serve them and help them make their homes more energy efficient.

Customers who complete the survey for their home will be mailed a package of 12 compact fluorescent lights. Once completed, the survey may be updated at any time. However, customers are limited to one energy efficiency incentive every 36 months for completing a survey for their home. Customers who move during this time period may complete a survey for their new home and receive the energy efficiency incentive.

Customer Name: _____ Duke Energy Account Number: _____

Last Four Digits of Social Security Number: _____ Address (optional): _____

- | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. Please tell us if you own or rent your home?</p> <p><input type="radio"/> Own</p> <p><input type="radio"/> Rent</p> <p>(the following questions are for renters.)</p> <p>2. Which of the following best describes your home?</p> <p><input type="radio"/> Detached single family</p> <p><input type="radio"/> Duplex</p> <p><input type="radio"/> Apartment / Condominium</p> <p><input type="radio"/> Mobile home</p> <p><input type="radio"/> Townhouse</p> <p><input type="radio"/> Multi-family</p> <p>3. To help us determine the approximate age of your home, when was your home built? (does not have to be exact)</p> <p>Year built _____</p> <p><input type="radio"/> Do not know</p> <p>4. What is the approximate size of your home? (If known, enter only the square feet. If unknown, please answer the questions on the number and size of rooms.)</p> <p>Square feet _____</p> <p>Excluding bathrooms and hallways, how many rooms are in your home? (Include finished basement)</p> <p>Number of rooms _____</p> <p>How would you describe the size of your rooms?</p> <p><input type="radio"/> Above average</p> <p><input type="radio"/> Average</p> <p><input type="radio"/> Below average</p> <p>5. How many people live in your home?</p> <p>Number of people _____</p> <p>6. On summer days, at what temperature do you keep your home?</p> <p>_____ °F</p> <p>7. On winter days, at what temperature do you keep your home?</p> <p>_____ °F</p> | <p>8. Does your rent include the cost of heating your home (i.e., Does your landlord pay for the electricity, natural gas, propane, etc. used to heat your home)?</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p>9. Does your rent include the cost of water heating for your home (i.e., Does your landlord pay for the electricity, natural gas, propane, etc. used for water heating in your home)?</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p>10. What is your primary source for cooling your home?</p> <p><input type="radio"/> Central air conditioning</p> <p><input type="radio"/> Heat pump</p> <p><input type="radio"/> Window / room air conditioner(s)</p> <p><input type="radio"/> Other or no cooling system</p> <p>11. Does your rent include the cost of air conditioning your home (i.e., Does your landlord pay for the electricity used for the air conditioning in your home)?</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No / Not applicable</p> <p>12. How old is your cooling system?</p> <p><input type="radio"/> Less than 5 years</p> <p><input type="radio"/> 5 – 9 years</p> <p><input type="radio"/> 10 – 14 years</p> <p><input type="radio"/> 15 – 19 years</p> <p><input type="radio"/> 20 or more years</p> <p><input type="radio"/> Do not know / Not applicable</p> <p>13. How would an occasional two degree increase in your home's indoor temperature during summer weekday afternoons affect you?</p> <p><input type="radio"/> No impact</p> <p><input type="radio"/> Small or moderate acceptable impact</p> <p><input type="radio"/> Unacceptable impact</p> | <p>14. Does your home have uneven temperatures between rooms?</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p>15. Does your cooling system have difficulty keeping your home comfortable?</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p>16. Does your heating system have difficulty keeping your home comfortable?</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p>17. Does your home have cold drafts in the winter?</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p>18. Does your home have sweaty windows (water condensation) in the winter?</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p>19. Duke Energy may use the information I have provided to offer me optional, unregulated services applicable to my home.</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

ENERGY EFFICIENCY SURVEY QUESTIONS – HOMEOWNER



Duke Energy thanks you and our customers for taking the time to complete this survey. We will keep your answers to these questions confidential. We will use this information to learn from our customers, develop new ways to better serve them and help them make their homes more energy efficient.

Customers who complete the survey for their home will be mailed a package of 12 compact fluorescent lights. Once completed, the survey may be updated at any time. However, customers are limited to one energy efficiency incentive every 36 months for completing a survey for their home. Customers who move during this time period may complete a survey for their new home and receive the energy efficiency incentive.

Customer Name: _____ Duke Energy Account Number: _____

Last Four Digits of Social Security Number: _____ Address (optional): _____

1. Please tell us if you own or rent your home?

☐ Own

☐ Rent

(the following questions are for home owners.)

2. Which of the following best describes your home?

☐ Detached single family

☐ Duplex

☐ Apartment / Condominium

☐ Mobile home

☐ Townhouse

☐ Multi-family

3. To help us determine the approximate age of your home, when was your home built? (does not have to be exact)

Year built _____

☐ Do not know

4. What is the approximate size of your home? (If known, enter only the square feet. If unknown, please answer the questions on the number and size of rooms.)

Square feet _____

Excluding bathrooms and hallways, how many rooms are in your home? (Include finished basement)

Number of rooms _____

How would you describe the size of your rooms?

☐ Above average

☐ Average

☐ Below average

5. How many people live in your home?

Number of people _____

6. On summer days, at what temperature do you keep your home?

_____ °F

7. On winter days, at what temperature do you keep your home?

_____ °F

8. What type of primary heating system do you have? (Select only one answer)

Electric

☐ Heat pump

☐ Forced air electric furnace (no heat pump)

☐ Baseboard or ceiling cable

☐ Portable electric space heaters

☐ Electric other

Natural Gas

☐ Forced air furnace

☐ Hot water or boiler with radiators

☐ Natural gas other

Fuel Oil

☐ Forced air furnace

☐ Hot water or boiler with radiators

☐ Fuel oil other

Propane

☐ Forced air furnace

☐ Hot water or boiler with radiators

☐ Space heaters

☐ Portable propane heaters

☐ Propane other

Other Sources

☐ Wood / Pellet

☐ Kerosene

☐ Solar

☐ Other

☐ Do not know

9. How old is your primary heating system?

☐ Less than 5 years

☐ 5 – 9 years

☐ 10 – 14 years

☐ 15 – 19 years

☐ 20 or more years

☐ Do not know

10. What is your primary source for cooling your home?

☐ Central air conditioning

☐ Heat pump

☐ Window / room air conditioner(s)

☐ Other or no cooling system

11. How old is your cooling system?

☐ Less than 5 years

☐ 5 – 9 years

☐ 10 – 14 years

☐ 15 – 19 years

☐ 20 or more years

☐ Do not know / Not applicable

12. How would an occasional two degree increase in your home's indoor temperature during summer weekday afternoons affect you?

☐ No Impact

☐ Small or moderate acceptable impact

☐ Unacceptable impact

13. What fuel is used by your water heater?

☐ Electricity

☐ Natural gas

☐ Propane

☐ Other

☐ Do not know

14. How old is your water heater?

- ☐ Less than 5 years
- ☐ 5 – 9 years
- ☐ 10 – 14 years
- ☐ 15 – 19 years
- ☒ 20 or more years
- ☐ Do not know

15. Does your home have uneven temperatures between rooms?

- ☐ Yes
- ☐ No

16. Does your cooling system have difficulty keeping your home comfortable?

- ☐ Yes
- ☐ No

17. Does your heating system have difficulty keeping your home comfortable?

- ☐ Yes
- ☐ No

18. Does your home have cold drafts in the winter?

- ☐ Yes
- ☐ No

19. Does your home have sweaty windows (water condensation) in the winter?

- ☐ Yes
- ☐ No

20. Duke Energy may use the information I have provided to offer me optional, unregulated services applicable to my home.

- ☒ Yes
- ☐ No

Final Report

**Evaluation of the
2009 Residential Smart \$aver[®]
Program in North and South Carolina**

Results of a Process Evaluation

**Prepared for
Duke Energy**

139 East Fourth Street
Cincinnati, OH 45201

Final: October 3, 2011, revised November 21, 2011

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November 21, 2011: *This report has been revised. A paragraph below Table 1 (page 16) was removed. There is no bias adjustment being applied to the freeridership number presented in Table 1, therefore the paragraph following the table that was referring to bias has been removed.*

Executive Summary

Summary of Findings

An overview of the key findings identified through this evaluation is presented in this section.

Significant Process Evaluation Findings

- The overall participant satisfaction with the program is high at 8.9 on a one-to-ten scale.
- Surveyed program participants cited general advertising and increased incentive as the two most effective ways to increase participation in the Residential Smart Saver[®] program.
- The majority (64%) of surveyed participants indicated that they were replacing equipment that had failed or was very near the end of its effective useful life.
- The trade allies would like to have the residential program application process available using a Web browser. This would make the program operate more smoothly for both Duke Energy staff and the Residential Smart Saver[®] partnering trade allies and would speed accessibility to the participation process and eliminate problems with obtaining or printing hard-copy application forms and transmitting them via fax or scanned email.
- The trade allies would like an increase in collaborative marketing between Duke Energy and the trade allies to raise awareness of the program. To achieve this they suggested that Duke Energy provide more literature on the program directly to their customers, to the trade allies, and to provide co-branded (between Duke Energy and the specific trade ally) literature to customers using contact lists supplied by individual trade allies.
- All trade allies considered the Residential Smart Saver[®] program an essential sales tool for energy efficient equipment.

Recommendations

- **Early retirement marketing and incentives:** Consider providing incentives for early retirement of equipment that are below existing federal levels. This would enable Duke Energy to continue to improve the penetration of high efficiency HVAC equipment while the HVAC technology advances further beyond existing federal standards. The costs of documenting and verifying early retirement measures are higher than just documenting purchases of higher efficiency equipment. However, because existing federal standards have recently increased, the program management acknowledges that the current Residential Smart Saver[®] incentives may not be enough to overcome the costs of obtaining higher-than-federal standard efficiencies.

- **Program Management Response:** Residential Smart Saver Program Management believes that the ability to offer an equipment financing option is vital to an early replacement program. Program Management will continue to evaluate the early retirement market as well as an equipment financing option in an effort to provide incentives to customers who choose to retire their HVAC systems before the end of its useful life. Program Management will also evaluate the value of early retirement as evidenced within the evaluation report (Approx. 31% of units had remaining useful life - 3.9 years on average) and will determine if further incentives would be cost effective.
- **Increased budget allocations:** Consider requesting higher levels of energy efficiency spending from the Commission to help meet program demand, thereby increasing energy savings without harming other programs in the portfolio.
- **Program Management Response:** Program Management is currently evaluating the addition of related measures to the Smart Saver Program. Upon identifying additional measures Program Management will present the desired measures to the Commission. At that time, Program Management will also revise Smart Saver participation and costs estimates and request an appropriate amount of dollars required to manage the program adequately and without harming other programs within the portfolio.
- **Test new technologies:** Consider test piloting the addition of the WECC recommended technologies starting with incentive levels that provide cost effective energy savings from those technologies. These include package heat pump units and mini-split ductless HVAC systems.
- **Program Management Response:** Duke Energy continues to evaluate the ductless AC systems and notes that they are an energy efficient product. The Smart Saver program currently incentivizes only 'whole-house' systems which generally excludes this technology. Additionally, Duke Energy will continue to evaluate all types of electric water heaters for incorporation into the Smart Saver Program.

Introduction

This report presents the results of a process evaluation of the 2009 Residential Smart Saver[®] Program in North and South Carolina. This effort employed interviews with program trade allies and a survey of residential customers using the program. To conduct the process evaluation we interviewed eight trade allies and surveyed fifty-five program participants.

Program Description

The Duke Energy Residential Smart Saver[®] program provides rebates for installations of higher efficiency heating and cooling measures in new or existing homes. Qualified purchases by residential customers are eligible for rebates of \$200 to the homeowner, and \$100 to the HVAC contractor/dealer. Home builders who install qualified equipment are eligible for rebates of \$300 that they may choose to pass on to the home buyers.

There are two types of measures for which rebates are available: central air conditioners (CAC) with electronically commutated fan motors (ECM)s, and heat pumps with ECMs. Duke Energy provides rebates for measures that have higher efficiency performance levels that are above current federal standards.

To participate, Duke Energy customers work directly with a participating HVAC contractor, select the eligible equipment, and provide their Duke Energy account number. The contractor completes the application for the rebate, providing the necessary AHRI certificates. Duke Energy has contracted with a third party, program administrator (Wisconsin Energy Conservation Corporation, WECC) who then processes the rebates and sends incentives to the customer and/or the contractor.

The program has been highly successful, to the extent that halfway through the 2009 program year, the implementer (Wisconsin Energy Conservation Corp - WECC) was directed by Duke Energy to focus more attention on recruiting Non-Residential Smart Saver[®] trade allies in order to promote the non-residential program's services, and place less focus on the residential program. That is, program demand out-stripped the program's budget's ability to meet customer demand for the program. The limits on the approved budget and the associated cost recovery mechanism acted to moderate the program enrollment efforts limiting participation and energy savings.

Process Evaluation Results

This section presents the findings from the process evaluation, which included in-depth interviews with program management, interviews with program implementers, and participant surveys.

Operational Efficiency & Implementation

Roles

Duke Energy manages vendors who implement the program. The main program vendor is the Wisconsin Energy Conservation Corporation (WECC) who covers the program within the five states in Duke Energy's territory: Ohio, North Carolina, South Carolina, Kentucky, and Indiana. Another vendor, Customer Link, handles customer phone calls and answers questions about general program information. The Duke Energy program manager reports that he is extremely satisfied with WECC's implementation of the Residential Smart Saver[®] program. *"They are a good handful to work with."*

WECC staff members serve as trade ally representatives and support the trade allies in all aspects. WECC trade ally reps inform prospective trade allies about the benefits of participating in the program, train trade allies on the application process, and answer trade ally questions about the status of the applications and rebates. WECC has a global goal of recruiting 30 trade allies a month across both the Residential and Non-Residential Smart Saver[®] Programs in the five states in Duke Energy's service territory.

Trade allies are participating HVAC contractors, distributors, and dealers who sell high efficiency equipment to Duke Energy's customers. The Duke Energy program manager acknowledges *"The trade allies are what makes this program work. We use this network in the home when the customer is making the decision."*

Trade allies are informed about the program through WECC trade ally representatives. Duke Energy and WECC have started conducting round table meetings with the trade allies in order to solicit their feedback on various aspects of the program. There were two trade ally round tables in the past program year.

Processing Applications and Rebates

Applications are processed by WECC within three days of receipt. If there are any errors in the application, the trade allies receive a letter within that three day period. If there are no errors, the rebate checks are sent out and the trade allies and customers receive them within 5 to 7 days of application. This response time is a best-practice in the industry. Few utility programs can match this performance, with typical approval and rebate processing taking 3 to 6 weeks.

For each qualifying measure, the customer receives \$200 and the dealer receives \$100. WECC reports they have received many compliments from the trade allies and customers on the speed with which they receive the rebate checks. Along with the checks, WECC also sends an acknowledgement letter that informs the customer that they may be visited by a Duke Energy representative in order to verify installation.

Marketing to Customers

The Duke Energy program manager reports that the program has been in operation for over 18 years and is running smoothly. The main method of marketing the program to residential customers is through the trade ally network. By all accounts, the trade allies are doing an excellent job of informing customers of the availability of the rebate from Duke Energy. The Duke Energy program manager reports that the trade allies are so effective that it is no longer necessary to market the program, although the program continues to be marketed on the Duke Energy website. This condition is consistent with a program that is well received by the contractors and trade allies, and has been in the market long enough to become established such that trade ally networks and customer networking has replaced the need for customer-focused market push efforts. The Duke Energy program manager also reports that the trade allies also have done an excellent job leveraging the federal tax credit to further motivate residential customers to purchase high efficiency measures.

Marketing to Trade Allies

The Residential Smart Saver[®] program has been so successful in recruiting trade allies over the years that very little ally marketing is needed. WECC reports, *"We rarely come across a dealer who is not aware of the program"*.

The WECC program manager reports that the program is so well known that residential customers will often ask for the rebate from non-participating dealers, in turn motivating the those dealers to contact Duke Energy and WECC to become participating trade allies. Another channel for prospective new trade allies comes from Customer Link, the call center that handles calls from Duke Energy customers. WECC reports that in many cases the customer will tell Customer Link that their dealer doesn't know about the Residential Smart Saver[®] program. Customer Link then passes that lead on to WECC for follow up contact and recruitment. As a result, the customer's contact with Duke Energy becomes the seed for growing the program's trade ally network and increasing both exposure and demand.

In the initial phases when Duke Energy and WECC were starting to promote the program, they used a top down approach by targeting the manufacturers, who then helped promote the program to their distributors and dealers. WECC reports *"Word got around very quickly"*. In this process the manufacturers saw the program as a way to move the higher end more efficient product lines and help increase revenues for their dealers; a win-win situation.

Training Trade Allies

At this stage, most dealers are aware of the program and the training of new trade allies has become a smaller and less important effort. When a new dealer becomes interesting in participating, WECC conducts training sessions with that dealer's sales team.

In the initial stages of the program, WECC has conducted training sessions with some of the larger distributors and contractor associations, but WECC reports that training sessions on that scale have not been needed for over six months.

Quality Control

WECC implements a quality control procedure in their review of the rebate applications. The review is incorporated into the rebate processing procedure. WECC maintains the database of program data including participant information, the specific measures rebated, and the rebate amounts. Duke Energy has full access to the database, and reports *“They have a very good database and good IT and are very responsive to all [Duke’s] demands.”* The Duke Energy program manager also compliments WECC’s quality control processes: *“All their processes seem as transparent as possible, and [transparency] is the greatest Quality Control.”*

The Residential Smart Saver[®] program also has an ongoing verification process; however, the program relies heavily on trade allies to provide accurate information about the installed equipment. WECC trade ally representatives inspect 5% of all installations, and sampling is stratified in three ways: 1. within qualifying equipment, 2. within the geographic boundaries of target cities, and 3. within high-activity trade allies. Trade allies who have unacceptable error rates in documentation or installation are flagged by WECC for higher inspection rates. Trade allies can be excluded from program participation if their verification rates are unacceptably low or if improvements are slow.

Although the Residential Smart Saver[®] program requires the HVAC system to include an ECM fan, currently only visual inspections are conducted. WECC mentions that there may be some potential for fraud if trade allies do not actually install an ECM fan; however, this potential is considered small.

Future Program Directions

Both Duke Energy and WECC foresee that program participation will drop once the federal tax credits for energy efficiency expire. It will be a challenge to maintain the high levels of participation without being able to leverage additional tax credits, particularly given the poor economy.

WECC suggests that the next best participants to target will be the home builders. WECC reports that the poor economy has been difficult for home builders, but that the upcoming Energy Star changes may renew builder interest in the Residential Smart Saver[®] program’s rebates. WECC is hopeful that the new Energy Star standards that are due to be rolled out in 2011 will help make installations of high efficiency HVAC equipment a standard practice among builders.

WECC and Duke Energy program managers both mention that one of Duke Energy’s future challenges would be to revise the Residential Smart Saver[®] program eligibility rules to stay on approximately on with Energy Star standards. Energy savings are calculated using federal standards of efficiency as a baseline, and the program manager has tried to maintain program efficiency requirements to be 20% above federal standards, and tried to stay ahead of Energy Star standards as another reference point. With current federal standards at 13 SEER and Energy Star standards tightening to SEER 14, Duke Energy may choose to revise Residential Smart Saver[®] standards to SEER 14.5 or SEER 15. But, until the market increases production, measures at that level of efficiency become increasingly expensive for the customer.

Future Improvements

There are very few areas for program improvement. WECC feels that the program is running very smoothly and efficiently. *"It's like clockwork."* The only area that might bear improvement would be the application process. WECC suggests that some examples of filled out applications might be published online, to help dealers avoid common errors in the application process. WECC also reports that while a new dealer's first batch of applications might contain errors, those dealers quickly learn what the applications require because WECC gives them feedback on how to improve their submissions.

Duke Energy reports that there are many ways in which the program might expand. The Duke Energy program manager reports that in his 18 years of experience in Duke Energy's Residential Smart Saver[®] program, the program has offered rebates on several different HVAC measures. One measure offered in the past was duct insulation, and another was duct sealing. Both of those are under consideration for future program offerings.

The Duke Energy program manager reports that they are currently investigating the potential impact and cost effectiveness of several of these options, but that the analyses have not yet been completed. Once the cost effectiveness analysis is completed, Duke Energy will decide if these measures should be included.

The Duke Energy program manager also reports that there will be a new web feature launched in the fall of 2010 that will direct online bill payers to a survey. The survey will provide Duke Energy with information about the age of the customers' furnaces and AC equipment. This would potentially allow Duke Energy to target specific customers for early replacement.

New Technologies

Based upon customer interest conveyed by the trade allies, the WECC program manager suggests two types of technology to consider for future inclusion in the Residential Smart Saver[®]. The first is a package heat pump unit, which can be placed entirely outside the house. The difficulty in including this measure is that current federal standards require an HSTF of 8.0. Achieving this performance threshold requires rebating higher cost units that are in limited supply because of lack of market demand at their current price. Providing rebates that would bring the cost of the units down to an attractive price for customers would likely decrease the cost effectiveness of the program as a whole because it will lower the amount of savings achieved per dollar of program costs compared to the current measures. The second measure recommended is a mini-split ductless HVAC system. WECC acknowledges that while there is a lot of interest in mini-splits because of the benefits of not needing ducting, however WECC reports that it is difficult to design a rebate system given the varying tonnage and efficiencies of the current mini-splits. *"It's hard to equate mini-split [energy] impacts with a 3-ton conventional unit."*

Incentive Levels

The trade allies have suggested at a round table meeting that Duke Energy might offer tiered incentive levels. The federal efficiency standards have increased to the extent that the Residential Smart Saver[®] program is hard pressed to find enough equipment that is higher than federal efficiency that would interest the customers at a reasonable cost. Each movement in efficiency

comes at a higher cost, especially as new standards push the efficiency threshold higher and higher. Incentive levels would need to be revised to reflect those increased costs and cost effectiveness objectives may need to be adjusted. This would require Commission approval.

Program Successes

WECC reports that participation has been highly successful, significantly beyond anticipated levels. The Duke Energy program manager is also satisfied with the program, and could not name anything that needed immediate improvement. *“It all works well. It is a seasoned program.”*

Participant Survey Results

In July 2010, TecMarket Works interviewed 50 Residential Smart Saver[®] participants during 2009 for which we were provided contact data and measure descriptions.

Equipment Used

Fifty- surveyed participants' equipment purchases include:

- Thirty-five 14 SEER heat pumps with ECM
- Fifteen 14 SEER AC with ECM.

Awareness

Participants were asked how they became aware of the Residential Smart Saver[®] program. Eighty-four percent (60%+24%) learned of the program either through their contractor or equipment supplier. Six participants (12%) learned of it through a friend or relative, while two and one participants respectively learned of the program through the Duke Energy Web site and a brochure from Duke Energy.

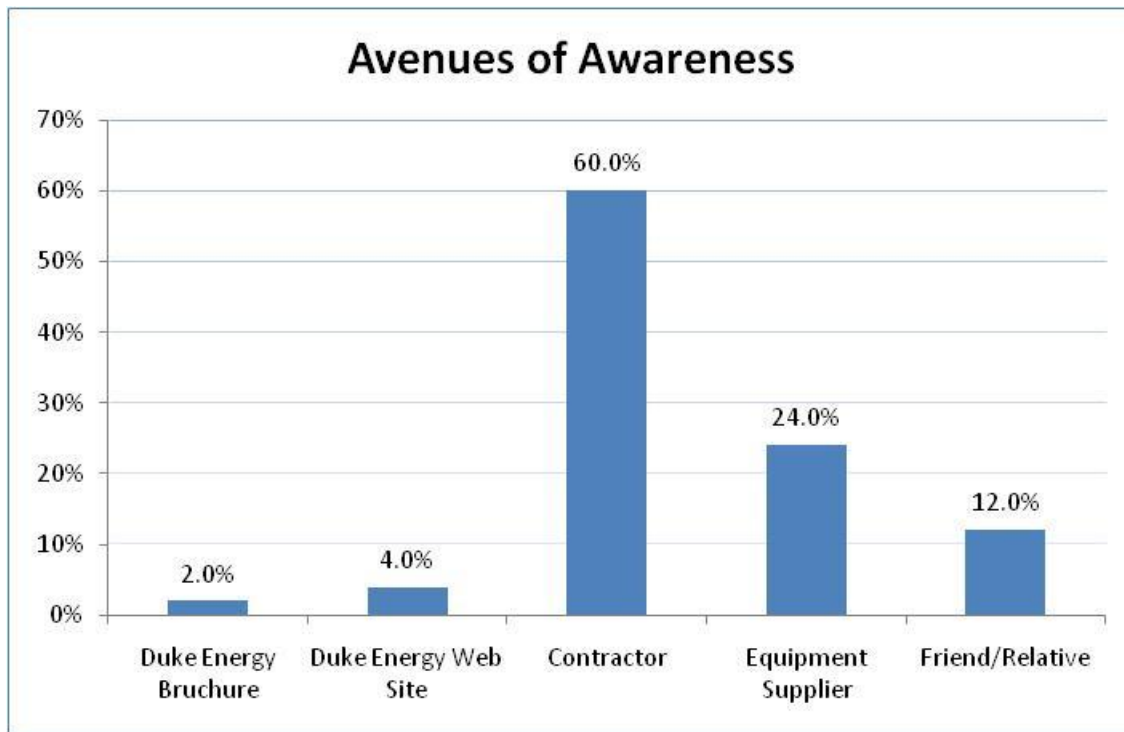


Figure 1. Avenues of awareness to the Residential Smart Saver[®] program. N=50

Overall Satisfaction

Participants were asked about their overall satisfaction on a one-to-ten scale with one indicating they were completely unsatisfied and ten indicating that they were completely satisfied with the Smart Saver program as well as the satisfaction with information provided by the program,

amount of rebate, ease of filling out the forms, time to receive their rebate check, and number of technologies covered by the program. As shown in Figure 2, Primary participants have a high satisfaction rate of 8.9 overall with the Residential Smart Saver® Program. Only the rebate amount category received any ratings less than 7 with seven customers giving it a five and twelve customers giving it a six. These 19 customers indicate that a higher rebate amount would increase their satisfaction level.

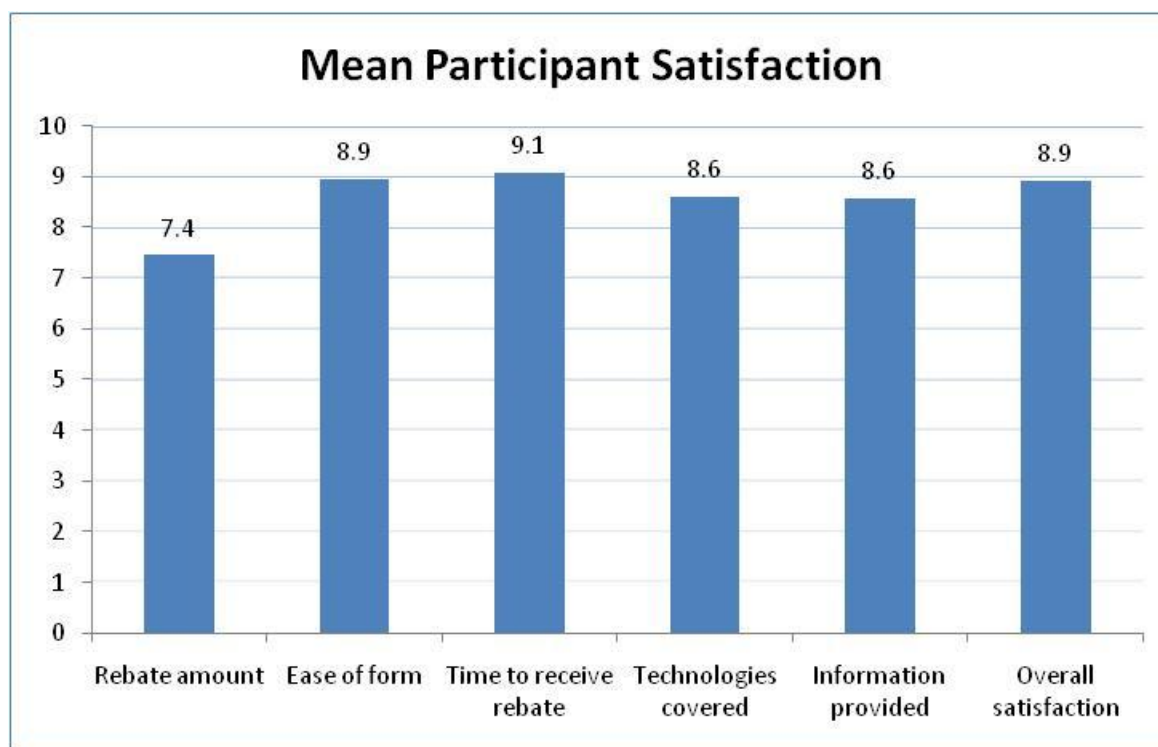


Figure 2. Mean Residential Smart Saver® Satisfaction Ratings (n=55)

Primary Motivating Factors

Participants were asked an open-ended question for the primary factor that motivated them to purchase their current equipment or replace the existing equipment. Over half of all respondents (64.%) indicated that equipment failure was their primary reason for buying the new equipment. Figure 3 shows the factors mentioned as well as the percentage of participants surveyed who mentioned that factor. No respondents in the Carolinas reported that energy saving was their primary motivating factor.

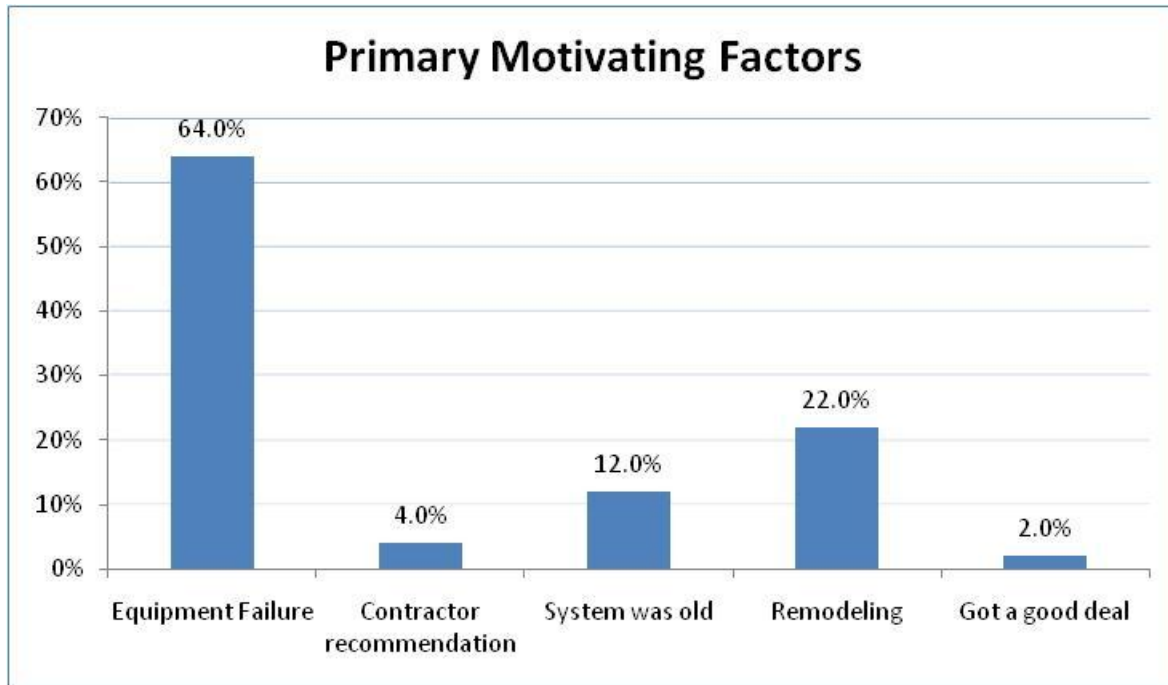


Figure 3. Primary Motivating Factors to Purchase Current Equipment (n=50)

Condition of Technology Being Replaced

Participants were asked if the technology they were replacing was in working condition or worn out and in need of repair. Thirty-three participants indicated that their old unit was either worn out or in need of repair and 17 said that their unit was in working condition. Those participants were then asked to estimate the remaining lifespan of the equipment that was replaced. The estimated average remaining life of the equipment in working condition is 3.9 years with a range of one to ten years.

Incentive Forms

Seven of the 50 survey participants indicated that they filled out the Residential Smart Saver[®] forms. Six of seven participants reported no difficulty in understanding or completing the application forms. One participant stated that the form was too long and it took multiple submittal attempts to receive the rebate.

Wait Time for Incentive

The length of time that passes from when the application forms are submitted, to the arrival of the rebate check are described as reasonable and free of problems by all 50 survey participants.

Free Ridership

Participants were asked how important the program rebate was to their decision to purchase a more energy efficient model. The results are shown in Figure 4. Two participants (4%) indicated that the rebate was the primary reason and four participants (8%) regarded the rebate as an important reason in their consideration. Twenty-eight participants (56.0%) said that the rebate

was one of the reasons, but not the most important, and 13 participants said the rebate was an unimportant reason.

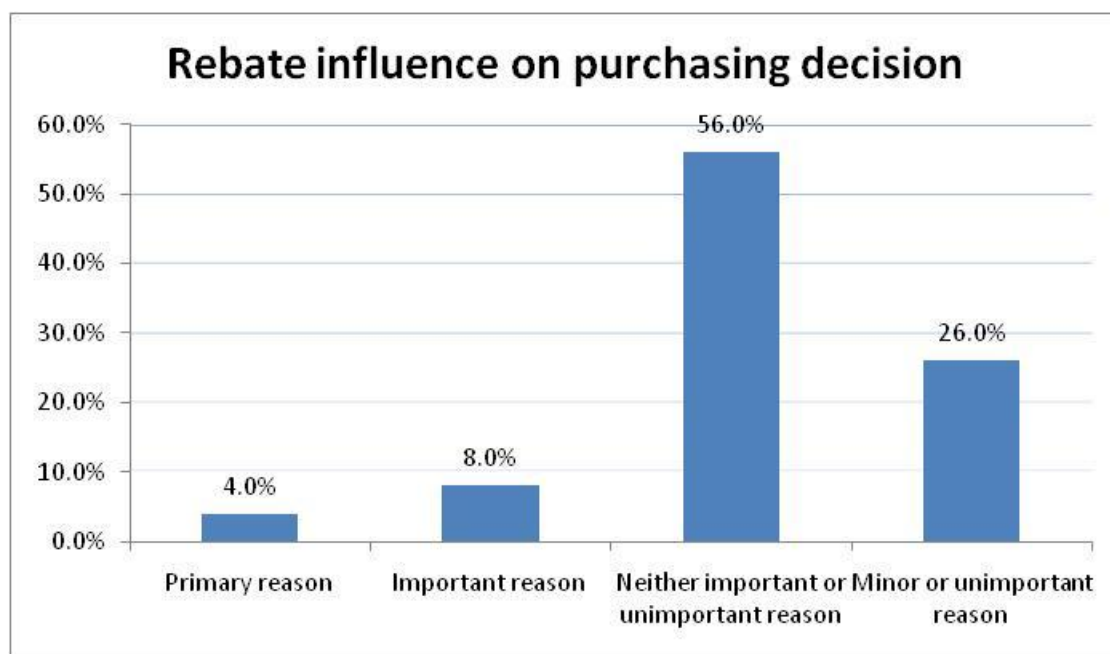


Figure 4. Rebate Influence on Purchasing Decision (n=54)

Surveyed participants were asked if the rebate had not been available whether they would have purchased the same measure or an equally energy efficient one. We also asked about the timeline associated with their purchase to determine if the change would have been made, but at a later time. Four out of the 50 surveyed participants indicated that they would have delayed the purchase of equipment without the program. One participant thought the delay would be at least a year, and the other three participants were unsure of the length of the delay.

Survey participants were read the following statement in order to rate the amount of influence the rebate had on their purchasing decision: "I would like to ask how important the program incentive was in your decision to buy the more energy efficient model. Would you say the incentive was..."

Possible responses were weighted for freeridership and included the following:

- The primary reason (no free ridership)
- An important reason (20 percent freeridership)
- Neither an important or unimportant reason (40 percent freeridership)
- An unimportant reason (80 percent freeridership)
- Not a reason at all (100 percent freeridership)

The freeridership multiplier from each rating is then multiplied by the percentage of respondents who chose that rating. The sum of the products of the percentages and multipliers is the unadjusted freeridership percentage.

The unadjusted free ridership percentage is calculated using Table 1. The overall free ridership is calculated to be 45.2 percent with a net to gross ratio of 54.8 percent (100 percent minus 45.2 percent.)

Table 1. Free Ridership Percentages

Amount of Rebate Influence	Free Ridership Multiplier	Number of Respondents	Percent of Respondents	Adjusted Free Ridership Ratio
Primary reason	0 percent	2	4%	0 %
Important reason	20 percent	4	8%	2%
Neither Important or Unimportant reason	40 percent	28	56%	22.4%
Unimportant reason	80 percent	13	26%	20.8%
Not a reason	100 percent	0	0%	0%
Sum			100%	45.2%

Surveyed participants were then asked an unprompted question as to what other factors besides the rebate that prompted them to buy the more energy efficient product. Thirty participants mentioned reducing energy costs as a reason (55%), five participants mentioned environmental concerns or wanting to “go green”, three participants said their equipment was recommended by a friend, three said that comfort was a factor in their decision, two cited reliability, and one participant said the unit they purchased was recommended in a package by the contractor.

Spillover

Surveyed participants were also asked if they had taken any additional energy efficient steps as a result of the Residential Smart Saver[®] program. Sixteen out of fifty-five participants (32%) indicated they had taken additional steps.

- Seven participants stated that they recycled more after participating in the program.
- Three participants said that they had improved their insulation.
- Two participants installed new doors.
- Two participants installed triple pane windows.
- One participant bought a waste heat recovery unit
- One participant bought an efficient washer and dryer.

What About Residential Smart Saver[®] Works Well

Each surveyed participant was asked what they think works well about the program. Thirty-nine participants cited the incentive as what they liked the most. Six cited the quikness of the rebate,

two cited the good feeling they received from going green, two cited the energy savings received on their new equipment, and one participant said the ease of use was their favorite part of the program.

Table 2. Residential Smart \$aver® Positively Viewed Components

Positively viewed component	N	Percentage
Incentive	39	78.0%
Rebate delivery time	6	12.0%
Altruism – going green	2	4.0%
Energy Savings	2	4.0%
Ease of use	1	2.0%

Increasing Participation

Surveyed participants were asked whether they thought certain suggested changes to the program operations would increase participation in Residential Smart \$aver®. The potential changes and the surveyed participants' responses are shown in Figure 5. An increase in general advertising and the incentive amount were thought of as effective strategies by a majority of survey respondents – over 70 percent for each.

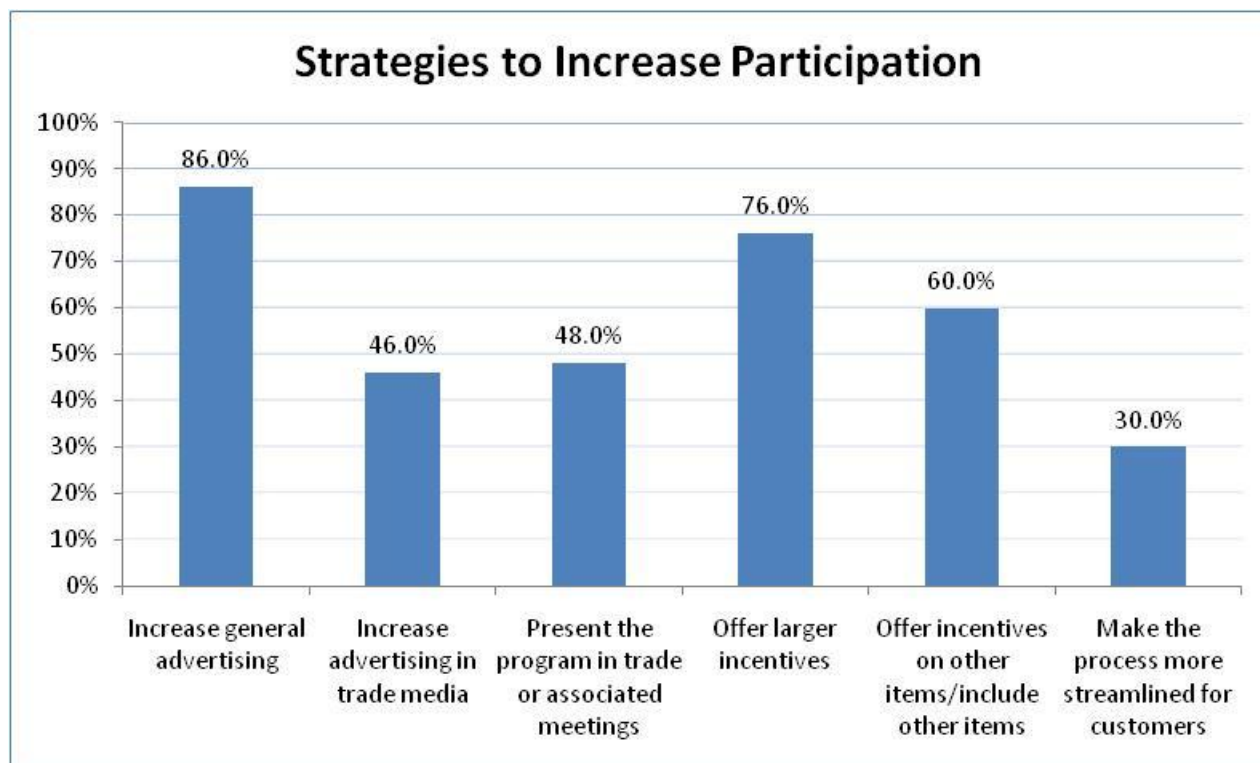


Figure 5. Strategies to Increase Participation in Residential Smart \$aver®

What Should Change About Residential Smart \$aver®

Surveyed participants were asked what they would like to see changed about the Residential Smart Saver[®] program. Ten surveyed participants mentioned that the cost of energy efficient equipment was still too high and they would like to see it lowered or the rebate level increased.

Trade Ally Interview Results

The eight Residential Smart Saver[®] trade allies were interviewed in June 2010. All of the interviews were conducted with a sales manager within the firm or an equivalent representative. Each of the respondents indicated that they are the individual within their company who has the most experience and is the most acquainted with the program. The interview protocol used during these interviews can be found in Appendix B: Residential Smart Saver[®] Contractor Interview Instrument.

The interviews were written to cover various aspects of the program, such as program operations, aspects of trade allies' involvement, incentive levels applied, covered technologies, and program effects from the trade allies' perspectives. The results of the process interviews are reported by the response categories presented below.

Program Materials

We asked the trade allies if they had enough program materials such as brochures, applications, and program documentation to effectively sell the program to their customers. All eight trade allies indicated that they had enough program forms and applications but thought that Duke Energy needed to provide more marketing materials. Three of the eight trade allies said that they had never seen any marketing material from Duke Energy about the Residential Smart Saver[®] program.

Problems That Have Come Up

All trade allies interviewed said that their experiences with the program were free of any problems and that they were pleased with the program.

When we asked about customer complaints from the trade allies' perspective; in response to our question, trade allies reported that there have been very few customer complaints.

Wait Time for Incentive

The length of time that passes from when the application forms are submitted, to the arrival of the rebate check are described as reasonable by all eight trade allies. The stated average length of time to wait for a rebate check varied very little from 2 to 3 weeks. While this evaluation did not confirm the wait times by reviewing the application dates and the date of the rebate distributions, past experience in these types of studies indicate that contractors and customers expect rebates to be promptly processed and paid.

What About Residential Smart Saver[®] Works Well

Each interviewed trade ally was asked what they think works well about the program. This question was then followed with a question about what changes should be made to the program. The trade allies responded to the question of what works well about the program with a variety of responses. Five out of eight trade allies mentioned ease of use and ease of forms as an aspect of Residential Smart Saver[®] that works well. Further, two trade allies noted that the ease of forms allowed them to maximize their time selling equipment rather than filling out forms. Specific responses include:

- “The rebate checks get out fairly quick.”
- “We like it all. In this economy the bottom line is what counts.”
- “It’s not a hassle and money gets to customers quickly.”

All trade allies interviewed see the program as a way to encourage customers to upgrade their air conditioning or heat pump to a higher efficiency level.

What Should Change About Residential Smart \$aver®

The responses to the question of what should be changed varied among the trade allies, with some vendors providing multiple responses. One of the common responses received is that trade allies would like to submit online applications, although it was noted that the form process currently works well.

Communications with Duke Energy Staff

All of the trade allies interviewed said that communication with Duke Energy staff was fine, though limited. All trade allies said that they were very satisfied with his responses to their questions.

Customer Awareness of Residential Smart \$aver®

Trade allies were asked how they made customers aware of the Residential Smart \$aver® program and then to describe the customers’ initial reaction to the program.

All of the trade allies said they tell their customers about the program during normal sales communications and present it as a way to achieve savings on their utility bills as well as their upfront costs. All trade allies said that customers respond positively to the idea of the incentive.

Five of the eight trade allies said that the majority of their customers were not aware of the Residential Smart \$aver® program before it was presented to them by the trade ally.

Why Trade Allies Participate

Why trade allies participate varies from the basics (increased sales/profit) to the altruistic (doing the right thing for their customers). Trade allies’ individual responses include:

- “It’s a great sales tool.”
- “It’s a win/win/win. Plus, we try to be green in our business and this helps our image in that area.”
- “Our bottom line doesn’t change too much, but it allows us to offer more options to our customers.”
- “In this economy, people are doing the math. The more you can save them in every area, the better.”

Program Technologies and Incentives

We also talked to the trade allies about the technologies offered in the program, and the incentives that are provided. The technologies covered and incentives provided through the Residential Smart Saver[®] program are supported by everyone we spoke with.

Technologies and Equipment Covered

All eight trade allies interviewed thought that no technologies currently covered by the program should be removed.

Incentive Levels

All trade allies interviewed indicated that they were satisfied with the current incentive levels. One trade ally noted that in a down economy any rebate level is much more important since buying an air conditioner is not always a necessity and it's a question of whether or not to buy the equipment rather than which model or SEER to buy. Half of the trade allies stated that more rebate is always better, but they are satisfied with current levels.

Other Technologies That Should Be Included

Trade allies mentioned two technologies that they thought should be considered for the program – ductless air conditioning and on-demand water heaters. Three trade allies mentioned ductless air conditioners, and one mentioned on-demand water heaters.

How the Trade Allies Bundle Products

Trade allies were asked if they bundled their air conditioners with other efficiency options. Six of the eight trade allies stated that they bundled options with their air conditioners. All six reported that they offered programmable thermostats with all of their air conditioners. Four of the eight trade allies offered duct insulation upgrades, two at six inches, one at four inches and one with a customers' choice of four or six inches, two trade allies bundled duct leak sealing and reported using a Retrotec duct leakage tester.

Trade allies were also asked what percentage of their air conditioners included bundled items. The six allies who bundled thermostats indicated that they did offer it with 100 percent of air conditioners. For duct insulation upgrades and sealing leaks, trade allies had a difficult time assessing a percentage since the bundled prices were available for all air conditioners but whether they were offered depended on the individual customer needs.

Two trade allies did note that the presence of the rebate allowed them to bundle prices more attractively than products with no rebate.

Program Results

We asked the trade allies about the benefits of their participation in the program to them and to their customers, and how the program has altered their business by changing what equipment they offer. None of the contractors have made significant changes to their marketing strategies because of the program. Their goal is to obtain the best price and quality for their customers. The incentives mean that they can push the energy efficient units at a reduced price allowing more customers to obtain immediate and lasting savings. These findings are consistent with the program theory to increase market penetration via rebates and incentives.

Residential Smart Saver's® Influence to Carry Other Energy Efficient Options

None of the eight trade allies said that the program has resulted in their businesses carrying other energy efficient equipment not covered by the program. Several trade allies did note that they do carry more energy efficient products now than before the program started, but that the increase has more to do with a general move toward energy efficiency rather than the specific program.

However, three trade allies did note that their sales staff has become more knowledgeable about the energy efficient models and items that they carry because of increased interest attributable to the program.

Market Impacts and Effects

Trade allies were asked what percentage of Residential Smart Saver® buyers are replacing older equipment that is still functional or failed units. On average, the eight trade allies indicated that that 27 percent of participants were replacing functional but less efficient equipment, while 73 percent were replacing failed equipment.

Trade allies also indicated that they have fewer calls to correct problems with Residential Smart Saver® appliances, but several allies noted that this may be because of the relative young age of the equipment.

Trade allies had multiple strategies for marketing the Residential Smart Saver® program including stickers, displays, advertising and sales pitches.

Program's Influence on Business Practices

We asked the contractors if their business would change if the Residential Smart Saver® program were no longer offered. We posed the question: *"If the program were to be discontinued, what would happen to the volume of sales of the high efficiency models?"* All eight trade allies indicated that sales would decline. Specific responses include:

- "People would either not get the product at all or go from 14 to 13 SEER."
- "We would scale back on those units for sure. Hard to say how much until the sales figures come in, but 25-50% is a good ballpark."

All eight of the trade allies said they would change their high efficiency model pricing structure if the program were no longer available.

Continuing Need For The Program

We asked the trade allies if they thought that the program was still needed. All of the interviewed trade allies said yes. All trade allies considered the Residential Smart Saver® program an essential sales tool for energy efficient equipment.

Free Riders

We also asked the trade allies to estimate the level of free riders. Five trade allies felt qualified to answer questions about their customers' level of free ridership. On average trade allies felt that 25 percent of air conditioners and 30 percent of heat pump customers would have still gone with the high efficiency units without the incentive. All five trade allies thought that all customers who purchased the high efficiency unit were influenced by the rebate Duke Energy offered.

Spillover and sales percentage

Trade allies were also asked if the program has influenced their decision to market or sell more high efficiency air conditioners and heat pumps. All eight trade allies said that this was the case. Five trade allies said they increased promotions and displays and three said they educated their sales staff more thoroughly on the incented products.

Lastly, trade allies were asked what percentage of sales were rebated through the Residential Smart Saver[®] program last year. Four trade allies gave numbers: 5%, 5%, 40%, and 10%.

Appendix A: Residential Smart \$aver[®] Participant Survey Instrument

Hello, my name is <name> with TecMarket Works and I am calling in regard to the rebate that you received from Duke Energy's Residential Smart \$aver[®] program. The purpose of this call is to ask you a few questions about your purchase and your satisfaction with the application and rebate. We are not selling anything. The survey will take about 5-10 minutes and your answers will be confidential, and will help us to make improvements to the program to better serve others. May we begin the survey?

1. Our records indicate that you participated in the Residential Smart \$aver[®] Program in <date> and that you installed <technology> through the program and received an incentive for your purchase. Do you recall participating in this program?

1. ☐ Yes, *begin*

Skip to Q2.

2. ☐ No,

99. ☐ DK/NS

1a. This program was provided through Duke Energy. In this program, you purchased an energy efficient <air conditioner or heat pump>. In exchange for purchasing the energy efficient option, Duke Energy provided you with a rebate check for \$<amount>.

Do you remember participating in this program?

1. ☐ Yes, *begin*

Go to Q2.

2. ☐ No,

99. ☐ DK/NS

If No or DK/NS terminate interview and go to next participant.

2. How did you become aware of the Smart \$aver[®] Program?

a. ☐ Duke Energy sent me a brochure

b. ☐ Duke energy website.

c. ☐ A contractor I was working with told me about the program

d. ☐ An equipment supplier

e. ☐ I saw an ad in _____

f. ☐ Other _____

g. ☐ DK/NS

3. When you first heard about the program and considered taking advantage of the offer, did you do any additional investigation to confirm the program's offering, or was the information you had adequate to make a participation decision?

- a. ☐ The information was adequate
- b. ☐ Didn't need to confirm/Nothing
- c. ☐ Went to the web site
- d. ☐ Called or emailed Duke Energy
- e. ☐ Called or emailed a contractor
- f. ☐ Called or emailed a salesperson
- g. ☐ Other: _____
- h. ☐ DK/NS

If c, d, e, f, g: **4. How well did this work for you, were you able to acquire a more complete understanding of the program?**

1. ☐ Yes 2. ☐ No 99. ☐ DK/NS

5. Did you have additional questions that were not answered? Were there questions that you were unable to answer or information that you were unable to obtain?

1. ☐ Yes 2. ☐ No 99. ☐ DK/NS

5a. What were they?

6. Who filled out the program incentive forms?

- a. ☐ I did
- b. ☐ Someone from my family did
- c. ☐ The contractor
- d. ☐ The salesperson
- e. ☐ Someone from Duke Energy

7. Who submitted the forms to Duke Energy?

- a. ☐ I did
- b. ☐ Someone from my family did
- c. ☐ The contractor
- d. ☐ The salesperson
- e. ☐ Someone from Duke Energy

8. *If they filled it out.* **Was the incentive form easy to understand?**

1. ☐ Yes 2. ☐ No 99. ☐ DK/NS

If not, 8b. Do you remember what it was that was not clear or which part of it was difficult?

9. **Did you have any problems receiving the rebate?**

1. ☐ Yes 2. ☐ No 99. ☐ DK/NS

If yes, 9b. Please explain the problem and how it was resolved. Was it resolved to your satisfaction?

10. **Did you originally plan on purchasing the exact same efficiency level in the equipment you purchased before you knew that there was a rebate offered by Duke Energy?**

1. ☐ Yes 2. ☐ No 99. ☐ DK/NS

11. **In your decision process, did you search for or consider other, less energy efficient equipment that might have cost less?**

1. ☐ Yes 2. ☐ No 99. ☐ DK/NS

12. **What was the primary reason that you decided to purchase or upgrade your equipment?**

1. ☐ Remodeling
2. ☐ Equipment failure
3. ☐ Contractor recommendation
4. ☐ Energy Savings
5. ☐ Got a good deal
6. ☐ It was an old system
7. ☐ Combination of above: *list:* _____

13. When you decided to replace your air conditioner or heat pump, what was the condition of the unit? Was it:

- a. ☐ Still functional or repairable
- b. or ☐ Worn out and in need of replacement

If still functional or repairable, how many more cooling seasons would you estimate the unit would have run before it needed to be replaced?

Record number: _____

14. I would like to ask how important the program incentive was in your decision to buy the more energy efficient model. Would you say the incentive was... *(read and check the best response)*.

- a. ☐ The primary reason why you purchased the high efficiency model,
- b. ☐ An important reason, along with other reasons,
- c. ☐ One of the reasons, but it was not the most important,
- d. ☐ One of the reasons, but it was a minor or unimportant reason, or
- e. ☐ It was not a reason at all,
- f. ☐ DK/NS.

15. If the rebate were not available from the program, would you have delayed your purchase, or would you have made the purchase at the exact same time?

- a. ☐ The purchase would have been delayed – **How long do you think you might have waited to make the purchase?** _____
- b. ☐ The purchase would have been made at the same time
- c. ☐ DK/NS

16. Were there other reasons in addition to the rebate that you went with the high efficiency <technology> instead of something less expensive to purchase?

17. When customers have experience with energy efficiency programs or products they sometimes make similar decisions to continue the energy savings in other parts of their homes or work places. Have you taken any other energy efficiency actions that may have been, in some way, influenced by your experiences with Duke Energy's Smart Saver® program?

1. ☐ Yes 2. ☐ No 99. ☐ DK/NS

- a. *If yes, What have you done? list:* _____
b. *If yes, How much money do you think you have saved as a result?*
- _____
- _____

I would like to ask you a few questions about the design of your home. The answers to these questions will help Duke Energy better estimate the energy savings resulting from your high efficiency air conditioner or heat pump upgrade.

18. Is your home built over a:

- ☐ crawlspace,
☐ slab on grade or a
☐ basement
☐ Other or Don't Know

19. Does the duct work in your home run primarily through:

- ☐ interior walls
☐ crawlspace
☐ attic, or the
☐ basement
☐ Other or Don't Know

20. Does your home have a programmable setback thermostat?

☐ Yes ☐ No ☐ Don't Know

21. One of the objectives that the program would like to meet over the next year is to increase participation. Can you think of things that the program can do to help increase participation or help increase interest from people like yourself?

- a. ☐ Increase general advertising
b. ☐ Increase advertising in trade media
c. ☐ Present the program in trade or associated meetings
d. ☐ Offer larger incentives
e. ☐ Offer incentives on other items/include other items
f. ☐ Have program staff call residential customers
g. ☐ Make the process more streamlined for customers
h. ☐ Make the process more streamlined for contractors
i. ☐ Other: _____

22. During your participation process, did you need to contact Duke Energy to obtain information about the program?

1. ☐ Yes 2. ☐ No 99. ☐ DK/NS

If yes, 22b. Were your questions or needs effectively handled by the Duke Energy?

1. ☐ Yes 2. ☐ No 99. ☐ DK/NS

If no, 22c. How might this be improved?

23. Overall, what did you like most about the Smart Saver[®] Program?

24. What did you like least?

We would like to ask you a few questions about your satisfaction with the program. For these questions we would like you to rate your satisfaction using a 1 to 10 scale where a 1 means that you are very dissatisfied with the program and a 10 means that you are very satisfied.

25. How would you rate your satisfaction with.

a. The amount of the rebate provided by the program

1 2 3 4 5 6 7 8 9 10

b. The ease of filling out the form to receive the rebate

1 2 3 4 5 6 7 8 9 10

c. The time it took for your to receive your rebate check

1 2 3 4 5 6 7 8 9 10

d. The number and kind of technologies covered in the program

1 2 3 4 5 6 7 8 9 10

e. The information you were provided explaining the program

1 2 3 4 5 6 7 8 9 10

For each item above that received a score of 8 or less ask:

21a. What could have been done to make this better?

For item a: The amount of the rebate provided by the program

For item b: The ease of filling out the form to receive the rebate

For item c: the time it took for you to receive your rebate check

For item d: the number and kind of technologies covered in the program

For item e: the information you were provided explaining the program

22. Considering all aspects of the program, how would you rate your overall satisfaction with the Smart Saver[®] Program?

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: What could have been done to make your experience better, or have we already covered it?

Thank you, we have reached the end of the survey. Do you have any comments that you would like for me to pass on to Duke Energy?

1. ☐ Yes: _____
2. ☐ No

Thank you for your time, have a nice day/evening/weekend.

Appendix B: Residential Smart Saver[®] Contractor Interview Instrument

Name: _____

Title: _____

Position description and general responsibilities:

We are conducting this interview to obtain your opinions about and experiences with Duke Energy's Residential Smart Saver[®] program. We'll talk about your understanding of the Residential Smart Saver[®] Program and its objectives, your thoughts on improving the program, and the technologies the program covers. The interview will take about an hour to complete. May we begin?

Understanding the Program

We would like to ask you about your understanding of the Smart Saver[®] program. We would like to start by first asking you to...

1. Please review for me how you are involved in the program and the steps you take in the participation process. Walk me through the typical steps you take to help a customer become eligible for this program and what you do to receive or help the customer receive the program incentive.
2. What kinds of problems or issues have come up in the Smart Saver[®] program?
3. Have you heard of any customer complaints that are in any way associated with this program? Have callbacks increased due to the program technologies?

Program Design and Design Assistance

4. Do you feel that the proper technologies and equipment are being covered through the program?
5. Are the incentive levels appropriate? How do they impact the choice by the customers of the higher efficient equipment?

6. Are there other technologies or energy efficient systems that you think should be included in the program?
7. Are there components that are now included that you feel should not be included? What are they and why should they not be included?

Reasons for Participation in the Program

We would like to better understand why contractors become partners in the Smart Saver[®] Program.

9. How long have you been a partner in the Smart Saver[®] Program?
10. What are your primary reasons for participating in the program? Why do you continue to be a partner?.... *If prompts are needed...* Is this a wise business move for you, is it something you believe in professionally, does it provide a service to your customers, do you want to build a relationship with Duke Energy, or other reasons?
11. Has this program made a difference in your business? How?
12. How do you think Duke Energy can get more contractors to participate in this program?

Program Participation Experiences

The next few questions ask about the process for submitting participation forms and obtaining the incentive payments.

13. Do you think the process could be streamlined in any way? How?
14. How long does it take between the time that you apply for your incentive, to the time that you and your customer receive the payments? Is this a reasonable amount of time? What should it be? Why?
15. Do you have the right amount of materials such as forms, information sheets, brochures or marketing materials that you need to effectively show and sell your Smart Saver[®] heat pumps and air conditioners? What else do you need?
16. Overall, what about the Smart Saver[®] Program do you think works well and why?
17. What changes would you suggest to improve the program?
18. Do you feel that communications between you and Duke Energy's Smart Saver[®] program staff is adequate? How might this be improved?

19. What benefits do you receive as a result of participating in Duke Energy's Smart Saver[®] Program or from selling Smart Saver[®] items?
20. What do you think are the primary benefits to the people who buy a Smart Saver[®] appliance? Are there other benefits that are important to a potential customer?

Market Impacts and Effects

21. How do you make customers aware of the Program?
22. Are customers more satisfied with this equipment? Why or why not?
23. Do you have fewer calls or more calls to correct problems with the Smart Saver[®] appliances?
24. Do you market or sell the Smart Saver[®] equipment differently than your other equipment? How?
25. What percent of Smart Saver[®] buyers do you think are replacing older equipment that is still functioning, but less efficient? What percent of Smart Saver[®] buyers do you think are replacing failed units?
26. Other than the energy efficient heat pumps and air conditioners, has the program influenced you to carry other energy efficient equipment that is not rebated through the program?
 - a. *If yes, what do you now carry?*
 - b. *If yes, About how many of these units did you install/sell in the last year?*
27. Do you bundle air conditioners with any other efficiency options?
 - a. *If yes, what percent?*
28. Set back thermostats?
 - a. *If yes, what percent?*
29. Duct insulation upgrades?
 - a. *If yes, what percent?*
 - b. *R Value or inches?*
30. Sealing leaks in duct work?
 - a. *If yes, what percent?*
 - b. *What instruments were used to assess leakage, apply sealing, or measure effectiveness?*

Heat Pump Questions

31. Has the program influenced your decision to market or sell more high efficiency heat pumps than you would have without the program?
 - a. *If yes*, To what extent?
32. Of those Energy Efficient heat pumps that were rebated through the program, what percent of those customers do you think would have still gone with an energy efficient model if the Duke Energy rebate were not available?
33. What percent of these customers do you think were in some way influenced by the rebate Duke Energy offered?
34. What percent of your total high efficiency heat pump sales were rebated through the Smart Saver[®] program last year?

Central Air Conditioner Questions

35. Has the program influenced your decision to market or sell more high efficiency air conditioners than you would have without the program?
 - a. *If yes*, To what extent?
36. Of those energy efficient central AC units that were rebated through the program, what percent of those customers do you think would have still gone with an energy efficient model if the Smart Saver[®] rebate were not available?
37. What percent of these customers do you think were in some way influenced by the rebate Duke Energy offered?
38. What percent of your total high efficiency central AC sales were rebated through the Smart Saver[®] program last year?

We would like to know what your practices were before you became a partner in the program, and what you would offer your customers without the program.

39. There are no plans to terminate the program, but we would like to know how the program effects contractors. If the program were to be discontinued, would you still offer the same energy efficient equipment options?
40. If the program were not offered, how would you structure pricing differently to make up for the program loss?
41. In your opinion is the Smart Saver[®] program still needed? Why?

Recommended Changes from the Participating Contractors

37. Are there any other changes that you would recommend to Duke Energy for their Program not already discussed?

Appendix C: Program Manager Interview Protocol

Name: _____

Title: _____

Position description and general responsibilities:

We are conducting this interview to obtain your opinions about and experiences with the Smart \$aver[®] and Summer Saver programs, which I will refer to as one program, the Smart \$aver[®] program. We'll talk about the Smart \$aver[®] Program and its objectives, your thoughts on improving the program, and the technologies the program covers. The interview will take about an hour to complete. May we begin?

Program Objectives

1. In your own words, please describe the Smart \$aver[®] Program's current objectives. How have these changed over time?
2. In your opinion, which objectives do you think are best being met or will be met?
3. Are there any program objectives that are not being addressed or not being addressed as well as possible or that you think should have more attention focused on them? If yes, which ones? How should these objectives be addressed? What should be changed?
4. Should the program objectives be changed in any way due to technology-based, market-based, or management based conditions? What objectives would you change? What program changes would you put into place as a result, and how would it affect the operations of the program?

Operational Efficiency

5. Please describe your role and scope of responsibility in detail. What is it that you are responsible for as it relates to this program?
6. Please review with us how the Smart \$aver[®] operates relative to your duties, that is, please walk us through the processes and procedures and key events that allow you to currently fulfill your duties.
7. Have any recent changes been made to your duties? If so, please tell us what changes were made and why they were made. What are the results of the change?

8. Describe the evolution of the Smart Saver[®] Program. How has the program changed since it was first started?
9. Do you have suggestions for improvements to the program that would increase participation rates or interest levels?
10. Do you have suggestions for improving or increasing energy impacts?
11. Do you have suggestion for the making the program operate more smoothly or effectively?

Program Design & Implementation

12. *(If not captured earlier)* Please explain how the interactions between the contractors, customers, and Summer Saver's management team work. Do you think these interactions or means of communication should be changed in any way? If so, how and why?
13. How do you determine which heat pumps and air conditioners are included in the program? How do you determine what efficiency levels should be placed in the program for heat pumps and central AC units? What should be changed about this selection process? Do you think this would result in more contractors and/or customers participating in the program?
14. Describe your quality control and tracking process.
15. Are key industry experts, trade professionals or peers used for assessing what the technologies or models should be included in the program? If so, how does this work?
16. Are key industry experts and trade professionals used in other advisory roles? If so how does this work and what kinds of support is obtained?
17. Describe Smart Saver[®]'s contractor program orientation training and development approach. Are contractors getting adequate program training and program information? What can be done that could help improve contractor effectiveness? Can we obtain training materials that are being used?
18. In your opinion, did the incentives cover enough different kinds of energy efficient products?

1. ☐ Yes 2. ☐ No 99. ☐ DK/NS

If no, 20b. What other products or equipment should be included and why?

19. What market information, research or market assessments are you using to determine the best target markets or market segments to focus on?
20. What market information, research or market assessments are you using to identify market barriers, and develop more effective delivery mechanisms?
21. Overall, what about the Smart Saver[®] program works well and why?
22. What doesn't work well and why? Do you think this discourages participation or contractor interests?
23. Can you identify any market, operational or technical barriers that impede a more efficient program operation?
24. In what ways can these operations or operational efficiencies be improved?
25. In what ways can the program attract more participants?
26. How do you make sure that the best information and practices are being used in Smart Saver[®] operations?
27. *(If not collected above)* What market information, research or market assessments are you using to determine the best target markets and program opportunities, market barriers, delivery mechanisms and program approach?
28. Are there any other issues or topics you think we should know about and discuss for this evaluation?

Process Evaluation of the 2011 Carolinas System Power Manager[®] Program

Final Report

**Prepared for
Duke Energy**

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November 14, 2011

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Summary of Findings

Customer Satisfaction

- Satisfaction with the Power Manager[®] program is high with over half of the survey respondents in both states rating their satisfaction at 9 or 10 on a 10-point scale for all program aspects including overall program satisfaction, as well as satisfaction with program enrollment, and program information.

Motivating Factors

- Three-quarters of the full participant survey respondents (n=49 in North Carolina and N=59 in South Carolina) were able to recall at least one benefit promoted by the program. In addition, the surveyed participants that recalled program benefits were able to provide 147 benefits (1.4 each) they recalled being promoted by the program. Of the 147 benefits recalled by these participants, 65% of them mentioned financial benefits either by recalling the bill credits or financial incentives for participating in the Power Manager[®] program.
- Most participants rate environmental issues as important or very important to their participation. About 6 percent of respondents in North Carolina and 8 percent of respondents in South Carolina are members of an organization with an environmental mission.
- Many (50% in North Carolina and 59% in South Carolina) of the participants do not recall whether control events occurred since they joined the program. Ninety-three percent of participants across both states did not notice the bill credits on their bill.
- Financial benefit is the most commonly recalled benefit (65% in both states) of the program as well as the most cited reason (58.6% in North Carolina and 66.1% in South Carolina) for participation.

Survey Findings

- The majority of participants (55% in both states) that are at home during a Power Manager activation event, experienced no change in comfort during the event.
- Ten percent of participants, who indicated that they were at home during an event, stated that they had noticed no Power Manager activation had occurred in the past seven days. Forty percent of event participants indicated they had noticed an activation, and 50 percent were unsure of whether an activation had occurred or not.
- Thirty percent of participants across both states contacted after a hot day without a Power Manager event stated that they thought an activation event had occurred in the past seven days even though no event had actually occurred. Twenty percent of these “non-event”

participants were correct in thinking that no Power Manager activation had occurred, and 50 percent were unsure of whether an activation had occurred or not.

- The age of air conditioner appears to be the most influential driver of perceived comfort change during a Power Manager activation.
- Two participants (5.7%) in South Carolina who experienced a change in comfort during a Power Manager control event reported using auxiliary or room air conditioners to compensate for the reduced cooling capacity of the central air conditioner during an event. Additionally, 31% reported using a fan during the control events to help maintain comfort levels, while 37% of the respondents report using a fan during non-event hot days during typical control time frames.
- Customers are comfortable in their home with their air conditioners on, and do not experience any significant change in comfort regardless of if there is a control event or not, or the degree of external temperature. There is no evidence of any correlation between high temperature (or heat index) and changes in comfort on days with Power Manager events.

Recommendations

- Consider using Home Energy House Call and Residential Smart \$aver[®] as a lead generation tools for new Power Manager enrollees so that participants in these programs have the opportunity to learn about and request participation in Power Manager. During these efforts, HEHC audits can examine the AC unit and determine if it is a good candidate for Power Manager before informing customers. Likewise, Residential Smart \$aver can serve as a lead tool by forwarding rebate information for new AC units to Power Manager marketing managers. These managers can then have contact information identifying customers who are predisposed to want to take energy efficiency actions in their home.
- If Duke Energy is interested in determining whether a new customer has the capacity to reduce by 1.3 kW, Duke Energy should consider having the installation technician gather additional information about the customer's AC units at the time of the switch installation and set participation conditions based on their housing observations. For homes with "smart-meters", Duke Energy could establish assessment algorithms that test the load swings during hot periods and establish a 1.3kW participation threshold.

Introduction

This document presents the evaluation report for Duke Energy's Power Manager[®] Program as it was administered in North and South Carolinas, herein referred to as "Carolinas" or "Carolinas System".

The evaluation was conducted by TecMarket Works with assistance from Yinsight. The survey instruments were developed by TecMarket Works. The survey was administered by TecMarket Works. Yinsight (a TecMarket Works subcontractor) conducted the in-depth interviews with program management.

Methodology: Management Interviews

The in-depth management interviews were conducted with five Duke Energy program staff and three representatives from Power Manager's two main vendors, Cooper Power Systems and GoodCents.

Methodology: Participant Surveys

TecMarket Works developed a customer survey for the Power Manager Program participants, which was implemented in July and August of 2011 after they experienced control events over the summer of 2011.

The complete survey was conducted with a random sample of 141 Power Manager participants in the Carolinas. There were 141 Carolinas customers willing to participate in the survey, however only 137 were able to complete the full survey. The responses from the 141 surveyed participants are included in the analysis for all questions which they were able to complete. These participants were surveyed by TecMarket Works. The survey can be found in Appendix B: Participant Survey Instrument.

Methodology: Recency Surveys

TecMarket Works conducted after-event, "recency" surveys, to collect participant information for this evaluation. The survey was maintained in a "ready-to-launch" status until notified of a control event affecting Cannon switches used by Duke Energy. The surveys were launched as soon as possible following the end of the control event (at 5pm Eastern) and continued over a 51 hour period with all call attempts made during regular surveying hours (10:00 a.m. to 8:00 p.m. Eastern Standard Time, Monday through Saturday). For example, if a control event occurred on a Monday, calling hours for that particular event were:

- Monday 5pm-8pm Eastern
- Tuesday 10am-8pm Eastern
- Wednesday 10am-8pm Eastern

Recency surveys followed events occurring on June 21, July 11, 13, 20, 21, 29, and August 2, 2011. TecMarket Works surveyed a total of 230 participants in North and South Carolina. The draft Recency Survey can be found in Appendix C: Participant Recency Survey.

Before we asked the participants about the event, we inquired if they knew that there was a control event within the last 7 days so that we could understand if they are able to identify when a control event had occurred. The surveyor then notified the customer that they had just had a control event which had begun at *<start hour of control>* and ended at *<end hour of control>*. This allowed the participants to immediately recall the time period of the event and be able to respond to questions regarding the impact of that event on their use of their air conditioner and allow recollection of other actions taken, as well as the impact of the event on their comfort. Once informed of the event that had just occurred, the survey also assessed satisfaction with the program at the point of an event.

TecMarket Works also called Power Manager participants on hot days without control events to conduct the same survey (with slight wording alterations, as shown in red text Appendix D: Participant Recency Survey for Non-Event Day Comparison). This survey was conducted on four different non-event days of at least 93°F. The heat index was also considered in determining a non-event day. On and following the high temperature dates of August 3, 4, 8, and 10, TecMarket Works surveyed a total of 111 Power Manager participants in the Carolinas.

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Section 1: Program Operations

Interviewees

The in-depth management interviews were conducted with five Duke Energy program staff and three representatives from Power Manager's two main vendors, Cooper Power Systems and GoodCents.

Program Background

Power Manager is a voluntary residential program, available to homeowners with central air conditioning (AC) and heat pumps. On days where energy demand and/or energy costs are expected to be high, Duke Energy has permission from Power Manager participants to cycle their air conditioning systems off for a period of time, in return for an incentive that is credited to their bill. Participating customers are told that they are able to help preserve the environment as well as to keep their electricity costs low by reducing immediate electricity demand and by delaying the need to build additional power plants in their region.

Power Manager has an economic component and an emergency component. The ability to call economic events allows Duke Energy to reduce the electricity usage and avoid the costs of generating additional electricity. Duke Energy can then pass savings from the avoided costs on to all their customers.

On days when Duke Energy anticipates system capacity problems, Duke Energy can implement an emergency event with a "full shed", where Power Manager participants shed their full air conditioning (AC) load for the duration of the emergency event. This allows Duke Energy to maintain the reliability of their transmission and distribution system and avoid blackouts.

Power Manager in the Carolinas System inherited the participants of what had been the old Load Control program (i.e., LC) prior to Duke Energy's merger with Cinergy. The old program was used only in times of system emergencies, in which case a full shed was implemented. When the old program was converted to Power Manager in 2009 (SC) and 2010 (NC), Duke Energy introduced demand response using AC cycling for economic reasons. Cycling an air conditioning system allowed participants' AC units to turn on for a portion of each half hour during an economic event. During any system capacity emergencies, however, Duke Energy can implement a full shed.

Within Duke Energy's portfolio, Power Manager[®] is currently the only residential demand response program¹. The Power Manager[®] program plays a key role in capacity planning; every year, Power Manager[®] provides an estimate as to how much capacity it can provide during the summer season, and this information is taken into account by Duke Energy's capacity planners.

¹ Duke Energy is currently piloting other demand response programs but these have not been commercialized yet.

Program Operations

Marketing and Enrollment

For 2011, marketing for Power Manager in both North and South Carolina was suspended pending the removal of a \$35 installation fee charged to new participants. Duke Energy had learned from the previous Power Manager evaluation study by TecMarket Works that a major barrier to attracting new participants to Power Manager is a \$35 fee for switch installation that was a legacy from the past residential demand response program in the Carolinas system. In June of 2011, Duke Energy had started the process to gain regulatory approval to remove the installation fee. Once the fee removal has been approved, Duke Energy expects to start marketing the program again in 2012.

Although the program is not currently soliciting new participants, Duke Energy customers may still learn about the Power Manager® program through Duke Energy's website. The website provides a toll free number to enroll by phone². A vendor, GoodCents, receives and processes the enrollment information, then schedules the switch installation with their technicians.

There are three requirements that must be met for a customer to be eligible to participate in Power Manager. First, they need to be a Duke Energy customer. Second they need to own and live in their single family home. Third, they need to have a functional central air conditioner or heat pump with an outside compressor that can be effectively controlled by Duke's load control technology.

Power Manager Incentives

New participants in the Carolinas must pay \$35 to enroll in the program, a legacy from past program years. As participants, they receive an \$8 statement credit for 4 months each year from July through October, for a total of \$32 each year. This incentive is paid whether or not Duke Energy calls any events.

Customers are told that in an average summer, 5-10 events are typically called. Power Manager cycling events will not be called on nights, weekends or holidays (except in a system emergency).

Switch Installation and Removal

Customers are told that a field technician will be coming out in 30-45 days. Customers do not need to be home for the installation, unless there are access issues.

During the installation, technicians first make sure that the AC is compatible and in good working condition. After they install the switch, the technician will conduct tests on the switch and leave a door hanger indicating the work performed, a number to call if the customer has any questions, and Power Manager® FAQs.

² There was no online enrollment form at the time of the interviews, but Duke Energy reports that they are developing a system that is expected by year's end.

Customers who no longer wish to participate are discontinued from the program and can do so by making a call to Duke Energy's customer call center. Duke Energy has recently implemented a new IT system enhancement to improve response to customer requests to discontinue Power Manager participation. Call center staff can remotely deactivate a Cannon switch and restore an AC system within approximately 10 minutes from the time the order is entered into Duke's computer system. Legacy Comverge switches can be remotely deactivated by the morning of the next business day. Customers with a PLC switch do not participate in any cycling events, because PLC switches were not designed to be cycled; they were only intended to be used to implement full load shed.

GoodCents is responsible for removing control switches and reports that the most common reason for removal requests is customer discomfort during events. However, GoodCents suggests that the perceived discomfort may be more mental than physical, since, in their opinion, home temperatures only rise, on average, 2-3 degrees during an event. However, homes with undersized units which can require a near 100% duty cycle to maintain set point temperatures may be impacted to a greater degree. GoodCents reports that the disconnect request rate has remained unchanged over the past year.

Incentive Payments

GoodCents provides Duke Energy with records of which customers had installations or were removed so that Duke Energy can apply or remove credits on the customer's bill. GoodCents reports that they've implemented tight security controls through use of firewalls and data backups. Quality control is implemented through comparison of GoodCents' files and Duke Energy's payout records.

Events

Cycling events. Power Manager participants may have their AC use curtailed during economic cycling events or emergency full shed events. Cycling events are called by Duke Energy's Retail Energy Desk (RED). This group is responsible for monitoring several variables that may indicate the need for a Power Manager[®] event. During the summer event season, a RED staff member monitors load forecasts, energy prices, system operating conditions, temperature and tracks recent event activity. On days in which all indicators suggest an event could be called, the RED staff calls a meeting with key stakeholders to consider whether or not to call a Power Manager[®] event. Stakeholders include customer service representatives, system operations representatives, and program managers. The meeting discussion revolves around whether there are any customer-related or system-related concerns about having an event. When the decision is made to have a Power Manager[®] event, the RED staff member notifies the appropriate supply and control personnel within Duke Energy, the call center (to be ready to field customer calls), others at Duke Energy, and GoodCents to provide the start and end times and which regions will be affected.

The RED staff triggers an event by means of a software "head-end" system. This head-end system sends out a signal to cycle AC units through a paging system over a VHF frequency channel that is owned by Duke Energy.

Emergency events. Emergency events are implemented by Duke Energy's Systems Operations Center (SOC). In the event of a system emergency, the SOC must decide which resources to call. Power Manager is Duke Energy's only residential demand response program, although Duke has other non-residential resources. The SOC uses their own software system and can initiate an emergency event without involving the RED or Power Manager staff. The SOC does keep Power Manager product management and the RED staff informed via email about the possibility of system emergency, in the hours leading up to declaring the emergency.

To help with SOC's capacity planning, the Power Manager RED provides the SOC with an estimate of how much load could be shed during events, given different daily temperatures. The RED provides this estimate by building a model that calculates load shed based on data from the prior year's events. A Duke Energy manager reports that they also tested the emergency system's full shed capability on May 31st and August 25th, and were able to identify and resolve some glitches in the switch communication system.

Coordination between emergency and cycling events. In the Carolinas system, emergency events can be launched independently of Power Manager cycling events. However, on days where emergency events might be called, Duke Energy's SOC will ask the Retail Energy Desk not to launch any cycling events so as to reserve Power Manager for their emergency use. A Power Manager program manager reports that this request stems from internal concerns that a transition from a cycling event directly to an emergency full shed might cause some damage to customer AC units. The program manager would like to be able to initiate a cycling event that can be transitioned smoothly to a full shed should SOC call an emergency event. To that end, the program staff has developed several possible solutions that will be tested after the summer event season.

RECOMMENDATION: Duke Energy should make it a priority to enable cycling events to make a safe transition to full shed events if possible. If one benefit of calling a cycling event is to help prevent a system emergency, then the Power Manager program needs to have the authority to call cycling events as they deem necessary.

Technology

The Power Manager program in the Carolinas system uses three different types of switches: a Powerline Carrier (PLC) switch, switches made by Comverge, and Cannon switches with newer technology made by Cooper Power Systems. These switches all allow one-way communication in real time. The newer Cannon switches also allow cycling data to be stored for several months. The PLC and Comverge switches are legacy switches used for a direct load control program before Power Manager was introduced in the Carolinas system. A Power Manager staff member reports that some of these legacy switches have been in place for 20 years. A high percentage of the older switches have been found to be no longer operable.

The finding that the Power Manager enrollment fee of \$35 was a considerable barrier to participation required Duke Energy to change their deployment plans. Instead of spending money trying to acquire more customers, Duke Energy decided to invest those funds in accelerating the schedule for replacing the old Powerline Carrier (PLC) and Comverge switches. In the past, Duke Energy has only replaced Comverge switches upon failure. In 2011, Duke

Energy began to switch out all Comverge switches with new Cannon switches. Both switch replacement projects have been accelerated and are now due to be completed in 2015. Duke Energy has contracted GoodCents to replace an estimated 164,000 legacy switches.

Duke Energy has instituted procedures to try to minimize the costs of the switch replacement project and reduce the number of customers that are removed from the Power Manager program due the discovery of an unauthorized switch removal at a customer's home. A Duke Energy manager reports that a pilot will be conducted to provide advance notice to customers of an upcoming inspection and possible upgrade of the Power Manager equipment. This will also serve to remind customers that they are enrolled on the Power Manager program and its benefits. Customers will be instructed to contact Duke Energy if they have questions. If a customer does not call to opt out of the program, a new Power Manager switch will be installed in situations where no switch is found. If the pilot proves successful, we will adopt this approach and as a result, expect to reduce the attrition associated with switch inspections and change-outs and save money in unnecessary field visits.

Duke Energy has also completed Phase 1 of a major IT project. With Phase 1 completed, Duke is now able to automatically deactivate Cannon switches when Duke customer service representatives process customer requests to be removed from Power Manager. Phase 2, which is due to be completed in October of 2011, will enable Duke and GoodCents to automatically exchange work requests and results via a secure web service. This will also include automation to update Duke's records with this information. At the time of these interviews, Comverge switch replacements required manual recording of switch ID numbers into a spreadsheet-based database. With the completion of Phase 2, the field technicians will be able to scan switch information into a handheld unit that will be downloaded and compiled electronically.³

Software. Cooper Power Systems recently provided a new software package called Quick Read that provides field technicians with the capability to download data to their computers within 2-3 minutes, after which it can be emailed to the research division. The previous version of the Cannon switch software required 20 minutes for each switch to be scanned, and the scanner could only hold data for 20 switches before it had to be brought back to Duke Energy's offices to be downloaded. The new software capabilities present a significant improvement in data collection efficiency. However, soon after the switches were installed, during a testing period, Duke Energy learned of some data problems that needed to be solved. At the time of these management interviews in July of 2011, Cooper is working with Duke Energy to resolve a data file problem that prevents immediate access to the Quick Read data. Because of the way that the switch is designed, during a scan, all data is first saved in a proprietary format. After that, the separate files from each switch are decoded. Due to a software error, the separate files are not being decoded automatically. In order to retrieve the data, the proprietary format data files need to be sent to Cooper Power Systems, where it is decoded by a project manager and then sent back to the research division. A Duke Energy staff member reports that this software issue was improved before the end of the summer data collection by Cooper by providing a new version of the Quick Read software.

³ Prior to this IT project, Duke Energy had already developed the IT infrastructure necessary to automatically record the replacement of PLC switches

Cooper Power Systems reports that it was Duke Energy who suggested that they develop a switch that enabled the use of a participant-specific load control duty cycle by incorporating AC capacity into the calculation of shed time. This new technology allows the Program to acquire a specific level of kW reduction from each participating AC unit based on the conditions applicable to each unit controlled. This new technical innovation represents a significant advancement for being able to control AC units to achieve a specific load reduction for each AC unit and for the Program as a whole. Duke Energy wanted to target a fixed kW level, such as 1 kW reduction from every house, which might require some AC units to be turned off for different lengths of time, depending upon their power usage. Prior to that time, that type of switch had not yet been developed, *"No one had that; no one could do that."* Cooper Power Systems reports that, working in response to Duke Energy's needs, they developed an intelligent Target Cycle switch that was able to convert the amp draw into a kW value. The Target Cycle switch has the additional benefit of preventing lower impacts from oversized AC units: if a customer had an AC unit that was twice as big as they really needed, then the AC's natural duty cycle could fit into a legacy switch's 50/50 cycle, resulting in zero load shed against that customer's baseline AC energy use. By using the intelligent switches, Duke Energy can more closely achieve the target kW during each event by controlling the duty cycle until that load attainment is achieved. This is a substantial improvement in the ability to acquire the contracted load reduction via residential AC load control programs and impacts load control programs well beyond Duke Energy's territory.

One Cooper Power Systems project manager mentioned that the Duke Energy Power Manager product manager gave a presentation on target cycling at their annual Cannon switch Users Group Meeting and that it was very helpful. They would recommend that Duke Energy continue to attend that the User's Group Meeting for several reasons: 1) it was an opportunity to receive more training on the technology, 2) it was an opportunity to meet and talk with Cooper's firmware and hardware developers face to face, 3) it was an opportunity for Duke Energy to direct the development of future technologies, and 4) it would allow Duke Energy to see what other utility customers were doing with the same equipment and perhaps give Duke Energy new ideas for demand response programs.

Vendor Relationships

Both vendors interviewed volunteered that Duke Energy staff was very easy to work with. One vendor states, *"I enjoy the partnership with them. They have been a great partner and it's always a joint venture."* Another vendor reports that they consider Duke Energy's "spring training" sessions to be *"an industry best practice"*. Every spring, the Power Manager team invites both GoodCents and Cooper Power Systems project managers to a multi-day session where all parties are free to share ideas and work collaboratively towards addressing any upcoming issues. *"It's such a nice way to run a program. We've taken that concept and tried to work with other big utilities to encourage them to do the same. Talking before there are problems or issues, and solving little things before they turn into big things; that's so helpful for everybody."* This opportunity gives all parties a chance to build relationships that can facilitate open communications in the future, and to delve into "big picture" issues without interruption in a way that may not be possible in a normal work day.

Power Manager Research

The Retail Energy Desk's research analysts have responsibility for determining the impact of the Power Manager[®] program. The research analysts conduct two main studies, an AC duty cycle study and a switch operability study. The AC duty cycle study provides a regression model of residential energy use (assuming all switches are in working order) during summer months if no events were called. This natural duty cycle can then be used as a baseline against which to calculate kW reduction when events are called. The AC duty cycle study is conducted with a sample of residents (referred to as "the M&V sample") who are often not cycled during events, in order to capture their energy use on peak load days.

The operability study provides an estimate of the number of AC units in the field that are responding as expected. By combining the operability ratio with results from the regression model, Duke Energy is able to provide an estimate of load reduction from the population of AC units with operable switches. The research division plans which operability studies to conduct at the beginning of each year; the operability studies are conducted on an as-needed basis. In 2011 for the Carolinas system, the research division is conducting one operability study on Cannon switches. In 2010, the research division had conducted an operability study on Converge switches in the Carolinas system.

This year, Duke Energy's research division is planning to conduct a separate payback study that looks at overall payback from an event. After an event call, air conditioners tend to run longer to handle the rise in indoor temperature that occurs after AC units have been cycled off. The payback study will look at event energy use including the period of time after an event call. Data collection occurs throughout the event season and is completed by the end of October of each year to allow time for impact analyses.

Impact analysis

One recommendation from the previous evaluation study was to estimate load reduction directly from a representative sample of the population, instead of modeling reduction using a natural duty cycle model. Duke Energy has adopted this recommendation and reports that they will be testing a methodology based upon that recommendation that uses data from a particular event to estimate payback, instead of using data that are averaged across several events.

Data Collection Efforts

Data collection efforts throughout the summer event season allow Duke Energy to monitor the quality of data being obtained. According to Cooper Power Systems, Duke Energy is unique among their customers for monitoring data quality and this has allowed Duke Energy to identify any problems with enough time to resolve them. *"What is going really well is what the [Duke team] does with the M&V data, and the fact that they're continuously collecting data so that they know what their system is capable of doing at any time. I have so many customers that wait until the end of the year to collect data only to find out something was not working...they might have had [switch] addressing wrong or some other little problem. These kinds of issues don't get past Duke...If I could copy what they do for our other utilities it would be a good thing."*

A research division staff member reports that her group had faced some challenges in 2011 with unanticipated data collection needs. Duke Energy hires contractors to collect data in the field, but

in order to scope their contracts, the research division had to estimate its sample sizes in February, prior to being able to finalize their kW model for Power Manager® 2011. When a problem arose with a planned data collection effort and the research division needed more data, they had initial difficulty obtaining additional data because it required efforts that were beyond the planned scope of the contract. That problem was resolved. Another Duke Energy staff member explains that their data collection vendors are routinely accommodating of requests outside of their contract terms but that each data collection effort requires planning and staffing. This staff member explains that each year's research needs are delineated during the Power Manager spring training sessions, well in advance of the event season. Because the timing and geographic coverage of these data needs vary depending on each research study, the vendor must have sufficient time to plan for and hire enough temporary staff for each effort: the wider the geographic coverage, the more staff they need to hire and train. The Duke Energy staff member explains that current contracts with vendors do include provisions for unanticipated data collection needs, but these data collection efforts cannot be fielded immediately simply because it takes time to adequately staff each effort.

AC Duty Cycle Study

The AC duty cycle study is collected throughout the summer. However, due to a bug in the new Quick Read software, the research division has not received the AC run time data at the time of these interviews (July of 2011). This is expected to be a temporary problem since Cooper Power Systems can manually decode the data files. This problem should be considered a one-time event because Cooper Power System is currently working on a permanent solution. The sample for the impact analysis of the Power Manager program in the Carolinas system is 143. This is a reasonable sample size and we do not recommend increasing it at this time.

Program Changes

One recommendation from the previous evaluation study was to add more staff to help with administrative needs during the control season. The Duke Energy program managers reports that staff has been added, and that program management has been restructured so that there is now a RED staff member dedicated to Power Manager® and one dedicated to PowerShare®, the nonresidential demand response program. In past years, program management was assigned based on geography so that the Midwest region had one RED staff member and the Southeast region had another RED staff member, with each one responsible for both Power Manager® and PowerShare® within their region. A Duke Energy manager reports that he has seen an improvement in operations with this new program management structure: *"It's working out better, to date"*.

Program Challenges

While the \$35 installation fee proved a challenge to enrolling new participants, the program management has used 2011 as an opportunity to make improvements to the program that will ensure greater success in future years. Duke Energy has wisely decided to discontinue efforts to enroll new customers until the \$35 installation fee barrier is removed, and instead to use those marketing funds to make improvements to the program by accelerating the replacement of legacy switches. A Duke Energy manager reports that Power Manager will also have new marketing materials that utilize messaging techniques and information learned from Power Manager marketing efforts in other parts of Duke Energy's service territory.

Duke Energy had identified a way to increase enrollment despite the installation fee barrier. As mentioned previously in the Technology section of this report, Duke has been removing customers from the Program when it discovers an unauthorized removal of a Power Manager switch as part of its switch replacement and field investigation efforts. In addition to developing the proactive communication as described earlier, Duke will be initiating an enrollment campaign targeted to customers living in former Power Manager homes that were removed from the Program due to the unauthorized switch removal. This effort leverages the accelerated switch replacement work. When GoodCents goes out on field visits to replace older switches, they often find that the switch is missing⁴. A Duke Energy manager reports that approximately 19% of switches may be missing, which may be expected, since some of the switches had been installed more than 20 years ago. Duke Energy will offer to re-enroll customers with missing switches at no cost because there would have been no cost had Duke installed a new switch at the time of the original field visit.

Future Plans for Power Manager®

Federal “Narrowbanding” Mandate. In the Carolinas system, Duke Energy owns a wireless frequency band on which they broadcast the signal to the Power Manager switches. A program manager reports that a federal mandate to restructure the radio frequency spectrum (“narrowbanding”) may affect the communications with the switches. While Cannon switches are expected to be able to operate within a narrower frequency band, there is some uncertainty as to whether the older switches can do so. The program manager reports that Duke Energy’s telecommunications division is working on a project to prepare their paging system for the restructuring.

Improving communications with HVAC trade allies. The Duke Energy product manager is currently considering improvements to the Power Manager® program, one of which is a communications network with HVAC dealers and repair service groups. This would allow Duke Energy to notify them of the start and stop times of any events so that they can properly respond to calls from customers during a Power Manager event about inoperable air conditioners. Another improvement that Duke Energy is considering is using the Duke Energy website to inform customers of events. While there exists a hotline that customers can call for information, providing event information on a website would meet the needs of customers who prefer web-based communications.

There do not seem to be any other major improvements to Power Manager® that are needed at this point, according to the interviewees. Although interviewees described several current efforts under way to address Power Manager® program challenges, most interviewees could not identify any new issues that had not or were not already being addressed. One vendor explained, *“That’s the benefit of [getting to know each other so well during] ‘spring training’, if we see it we can just tell them. I don’t see anything outstanding.”*

⁴For the 2009 Power Manager evaluation study, Duke Energy managers reported that HVAC technicians sometimes remove or disconnect the switches when they are repairing or replacing customers’ AC units.

Section 2: Participant Survey Results

TecMarket Works conducted telephone surveys with 71 randomly selected program participants in the state of North Carolina and 71 randomly selected program participants in the state of South Carolina for a total of 142 participants. This section presents the results from the surveys. The survey instrument can be found in Appendix B: Participant Survey Instrument. Of the 142 participant surveys, completed surveys were obtained from 70 participants in North Carolina and 70 participants in South Carolina. The results from the 140 completed surveys are presented below, with the results of the partial surveys included as applicable.

Participation Drivers

Surveyed Power Manager[®] program participants in the Carolinas were very likely to have been involved with the decision to participate in the Power Manager[®] Program with all but two out of 81 surveyed (97.5%) indicating that they were involved.

Table 1. Were you involved in the decision to participate in Duke Energy's Power Manager[®] Program?

	Combined		NC		SC	
	N	Percent	N	Percent	N	Percent
No	9	6.3%	7	9.9%	2	2.8%
Yes	130	91.6%	62	87.3%	68	95.8%
Don't Know	3	2.1%	2	2.8%	1	1.4%

Most of the surveyed participants who recalled where they first heard of the program reported that they learned of the Power Manager[®] program from a direct mail offer or through a bill insert from Duke Energy. Very few surveyed participants learned of the program from the Duke Energy web site or through word of mouth in either North or South Carolina. Direct mail continues to be the most successful approach for enrolling customers compared to all other approaches examined.

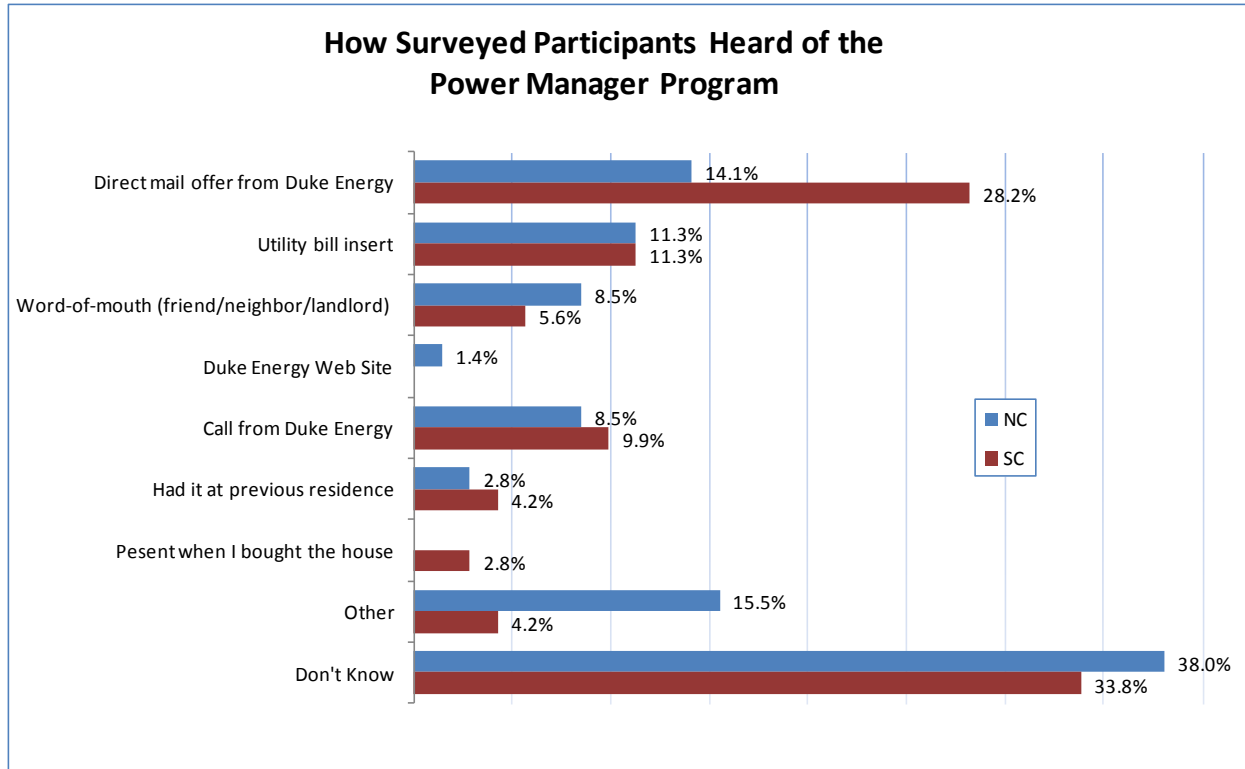


Figure 1. How Participants Learned of the Power Manager® Program (N=71 for both states)

Recalling Promoted Program Benefits

During the survey, we asked participants an unprompted question to recall what the promoted program benefits were. The results are presented in the table below, and summarized in Figure 2. The “Tags” column categorizes the survey responses using five tag words to summarize various responses, including:

1. Money savings: used if the participant mentioned bill credits or lowered bills
2. Energy savings: used if the participant mentioned energy savings
3. Reduced outages: used if the participant mentioned reduced load or preventing brown-outs or black outs
4. Reduced need to build new power plants: used if the participant mentioned this potential benefit.

The tag words/responses are then summarized in Figure 2.

Table 2. Participants' Recalled Program Benefits

Recalled Benefits	Number of times mentioned by NC participants	Percentage of participants (n=49) recalling each benefit in NC	Number of times mentioned by SC participants	Percentage of participants (n=59) recalling each benefit in SC
Money Savings	45	91.8%	51	87.9%

Energy savings	15	30.6%	16	27.6%
Reduce Outages	10	20.4%	9	15.5%
Reducing need to build new power plants	-	-	1	1.7%

Note: adds to more than 100% due to multiple responses

Forty-nine (69%) of the surveyed participants in North Carolina were able to recall benefits promoted by the program. In South Carolina 59 of the surveyed participants (83.1%) were able to recall benefits promoted by the program. The surveyed participants that did recall program benefits were able to provide 147 benefits that they recalled being promoted by the program (70 in North Carolina and 77 in South Carolina). Of the 147 benefits recalled by these participants, 65.3% of them mentioned money savings either by recalling the bill credits or financial incentives for participating in the Power Manager[®] program. The next most commonly recalled program benefit was the energy savings that can be obtained through participation at 21.1% of recalled benefits. Almost thirteen percent of the recalled benefits included a mention of the load control function of the program as a means of reducing blackouts and/or brownouts.

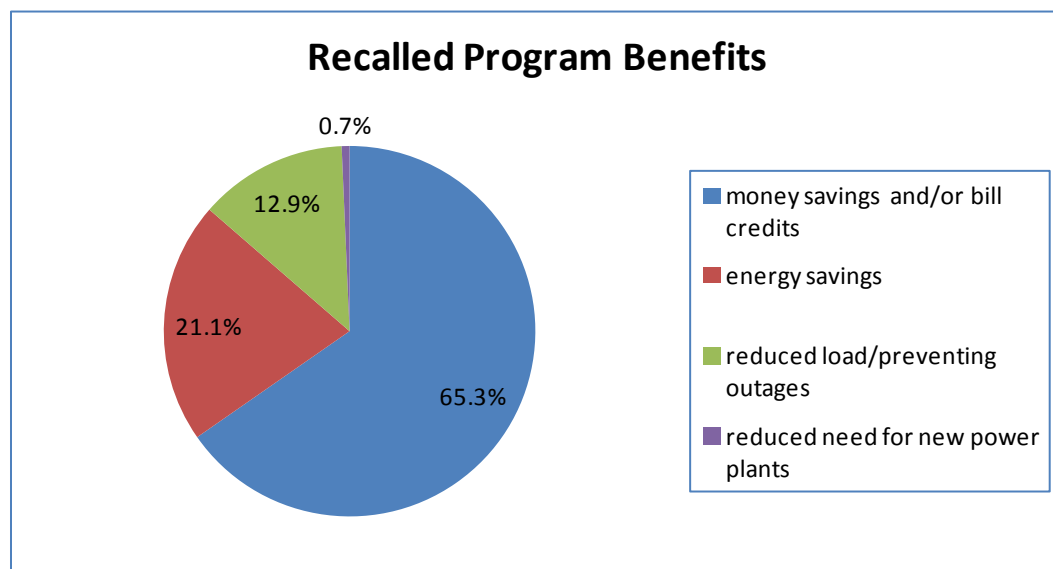


Figure 2. Recalled Program Benefits: Summary of Responses for Both States

In addition to asking about the benefits of the program, TecMarket Works also asked the surveyed participants about their reasons for participating in the Power Manager[®] program. The most common response (62% across both states) was “for the bill credits”, however many respondents expected to help Duke Energy avoid energy shortages (16% across both states) if they participated. Saving energy was also an often-cited reason.

Table 3. Reasons for Participation in Power Manager[®]

Reason for Participation	NC		SC	
	N	Percent	N	Percent

For the bill credits	41	58.6%	45	66.1%
Helping avoid power shortages/outages	11	15.7%	11	16.2%
To save energy	4	5.7%	10	15.7%
To help the environment	1	1.4%	-	-
I don't use the air conditioner much	1	1.4%	-	-
Other: not specified	2	2.9%	1	1.4%
Don't Know	10	14.3%	1	1.4%

After respondents told us why they participated in Power Manager[®], we asked them if they recalled reading about the benefits or reasons presented in the program brochure. Table 4 and Table 5 summarize their responses. Fewer than a third of all respondents could recall whether they had seen the program brochure.

Table 4. Reason for Participation: Read in Program Brochure in North Carolina

	Do you recall reading about this benefit on the program brochure?					Total
	No	Yes	Do not remember brochure	Did not get brochure	Don't Know	
To save energy	0	3	1	0	0	4
Helping Duke avoid power shortages/outages	0	4	6	0	1	11
To help the environment	0	1	0	0	0	1
For the bill credits	0	9	29	1	2	41
I don't use the air conditioner much	0	1	0	0	0	1
Total	0	18	36	1	3	58

Table 5. Reason for Participation: Read in Program Brochure in South Carolina

	Do you recall reading about this benefit on the program brochure?					Total
	No	Yes	Do not remember brochure	Did not get brochure	Don't Know	
To save energy	0	3	7	0	0	10
Helping Duke avoid power shortages/outages	0	1	10	0	0	11
To help the environment	0	0	1	0	0	1
For the bill credits	0	11	33	1	0	45
Total	0	15	51	1	0	67

Importance of Environmental Issues to Participants

Most (93% in North Carolina and 89% in South Carolina) surveyed Power Manager[®] participants indicated that environmental issues are either “important” or “very important” to them. Only one of the respondents in each state indicated that environmental issues were “not at

all important”, and a few said that they thought environmental issues were “not important” or “neither important nor unimportant.”

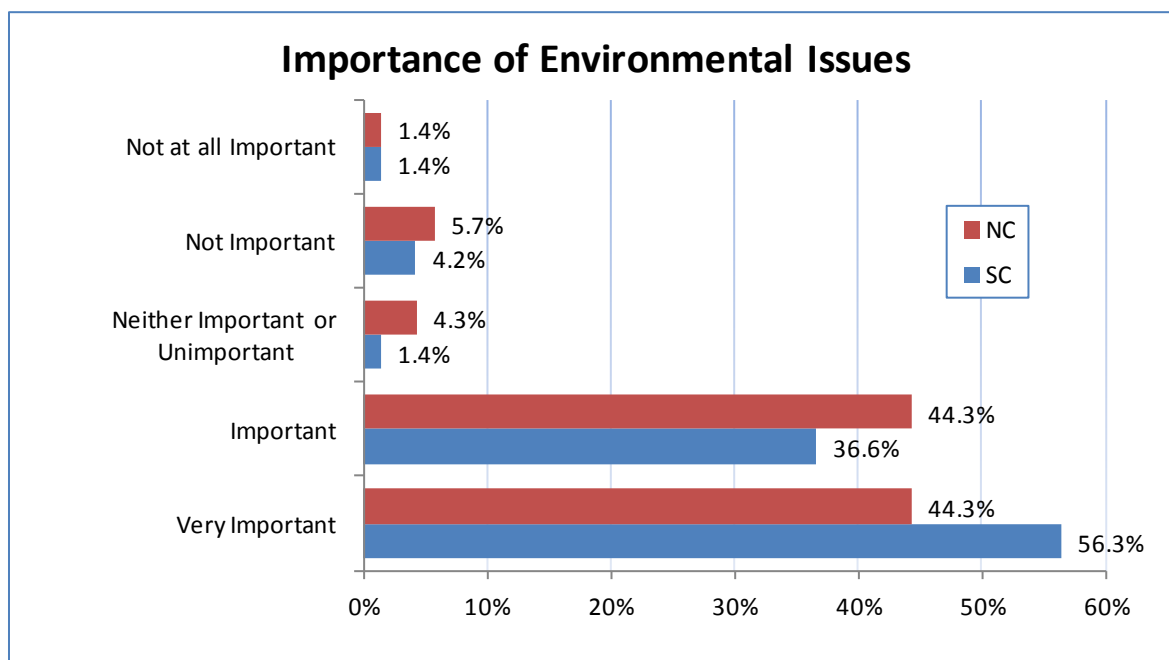


Figure 3. Importance of Environmental Issues to Power Manager® Participants

When TecMarket Works asked the surveyed participants about the importance of climate change issues, responses shifted slightly. Seventy-five percent of participants in North Carolina and sixty percent of participants in South Carolina found climate change issues to be “very important” or “important”. However, 22% of participants in South Carolina and 13% of participants in North Carolina found them to be “not important” or “not at all important.”

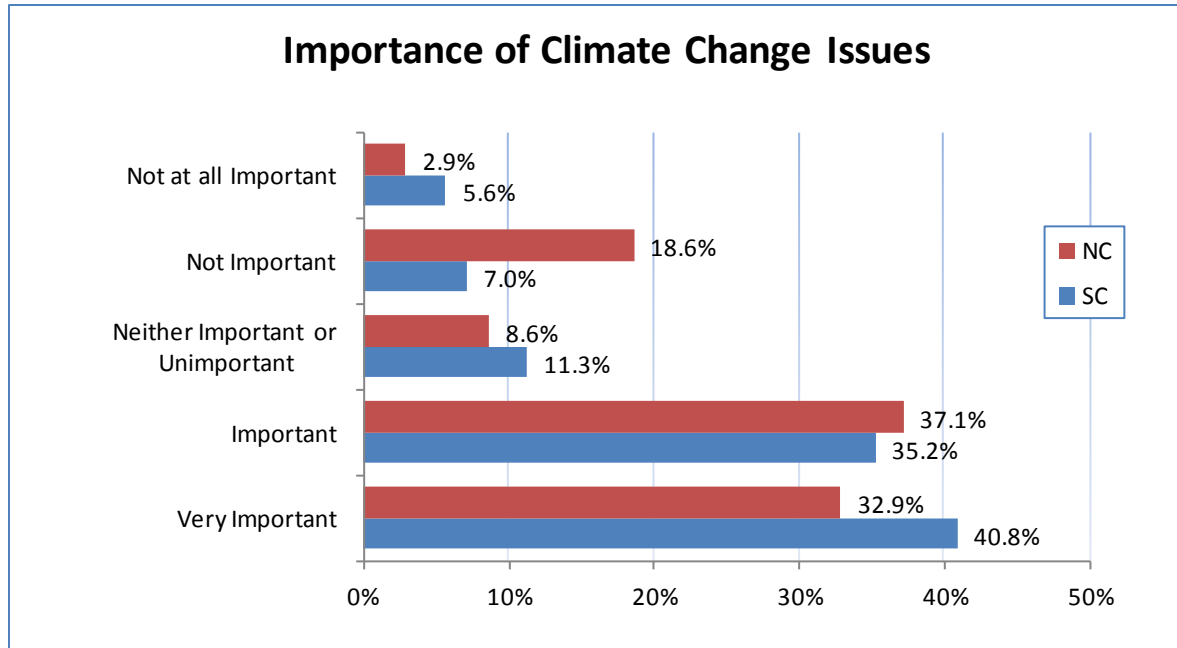


Figure 4. Importance of Climate Change Issues to Power Manager® Participants

Reducing air pollution was more important to participants than climate change issues and very similar to importance of environmental issues overall. Ninety-seven percent of North Carolina participants and 93% of respondents in South Carolina said that reducing air pollution was “important” or “very important” in their participation decision. Power Manager® participants represent a population segment that is focused on environmental issues and considers these issues important or very important in their participation decisions.

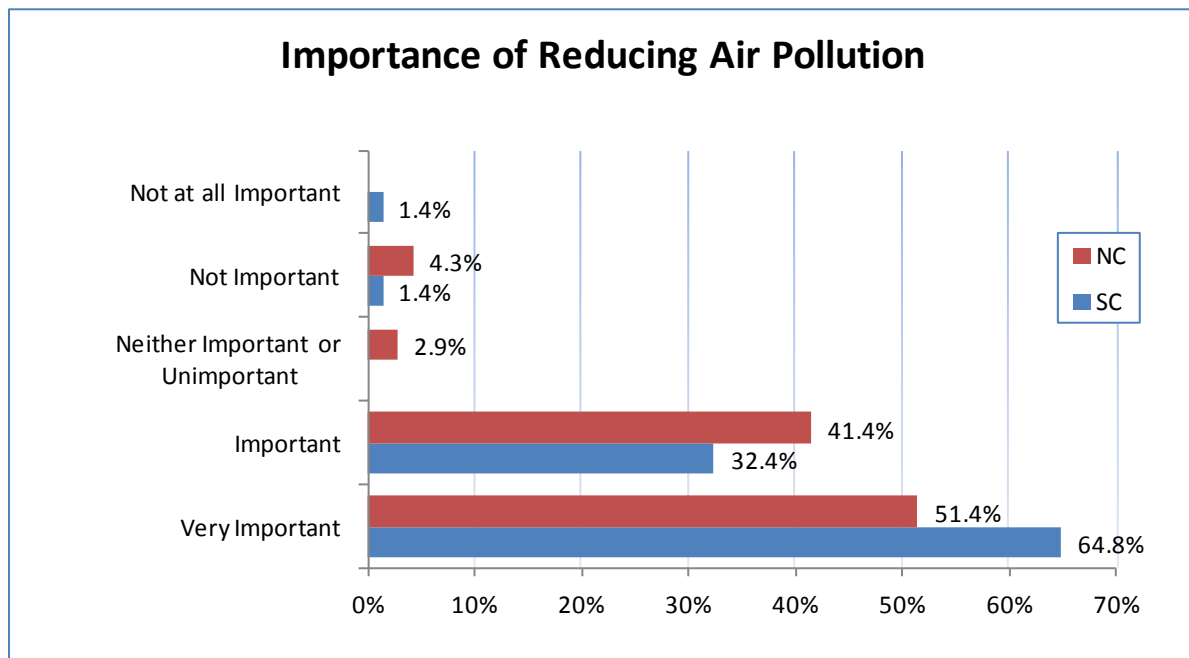
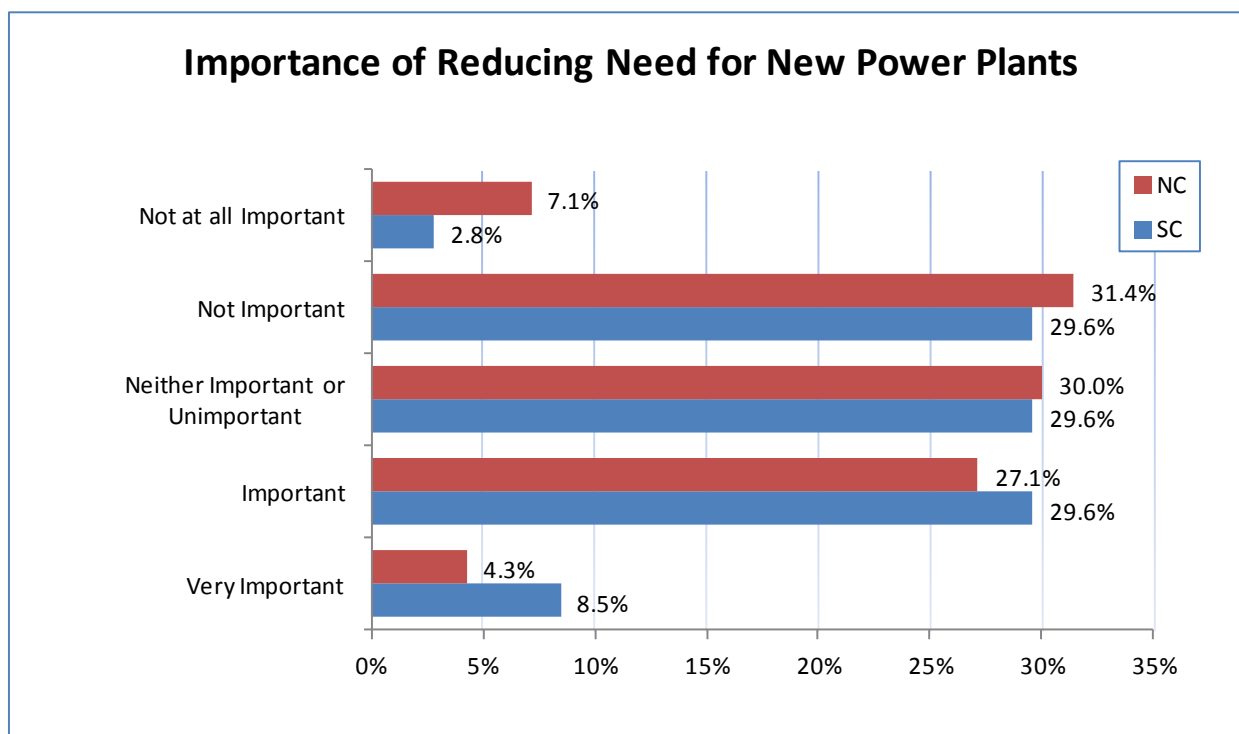


Figure 5. Importance of Reducing Air Pollution to Power Manager® Participants

When the respondents were asked how important it was to reduce the need for new power plants, opinions varied more than with previous environmental issues. Only 8.5% of North Carolina respondents and 4.3% of South Carolina respondents rated this issue as “very important” to them. Participants seem to be okay with building new power plants as long as they do not result in increased pollution or, to a lesser degree, impact climate change.

**Figure 6. Importance of Reducing Need for New Power Plants to Power Manager® Participants**

While environmental issues are important or very important to these customers, only five of the eighty surveyed participants are members of a group or club that has an environmental mission (6.7%).

Table 6. Are you a member of any groups or clubs that have environmental missions?

	No	Yes	Total
NC	66	4	70
	94.3%	5.7%	100%
SC	65	6	71
	91.5%	8.5%	100%

If respondents indicated that they were a member of an organization with an environmental mission, we asked for the name of the organization. Some of them were able to provide specific

names while others could not. In addition, most of these respondents identified organizations that are not environmentally focused as their primary mission, indicating that very few of the participants are associated with an organization that has environmental causes as their primary mission. Their responses are listed below.

In North Carolina:

- Environment North Carolina
- Ducks Unlimited
- Duke University Medical Center
- National Rifle Association
- Democratic Party

In South Carolina:

- Nature Conservancy
- Ducks Unlimited
- Greenville Organic Farming Organization
- Rotary Club
- South Carolina Farm Bureau
- Lyman Town Council
- Upsy Daisy garden club

Participant Understanding of the Program

Participants are satisfied with the program information that was provided to them, giving the program information a mean score of 8.9 in both states on a 1-10 scale with 10 indicating that they were “very satisfied”. Twenty-eight participants in NC and 17 participants in SC answered “Don’t Know” for this question giving it a sample value of 42 in NC and 54 in SC.

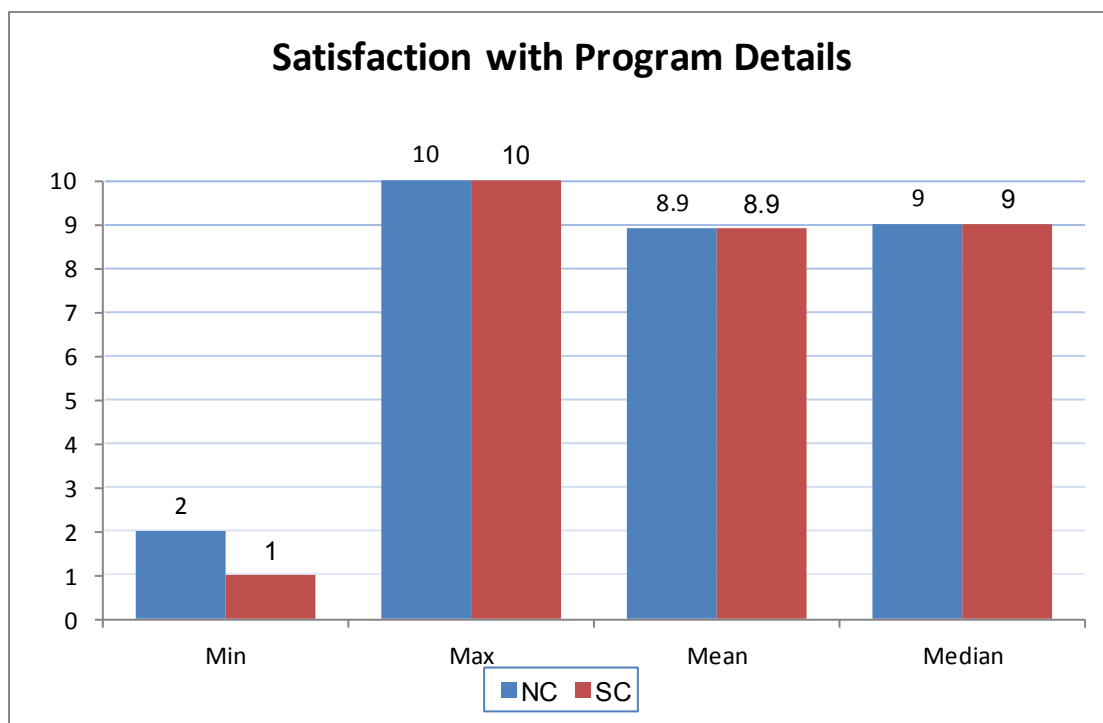


Figure 7. Participant Satisfaction with Program Details

If a respondent indicated that their satisfaction with the program details was 8 or lower, we asked them why they were less than satisfied. Three of the nineteen, who provided scores of 8 or lower, provided a reason. The reasons for low satisfaction scores that were provided are listed below by state.

North Carolina

- “I didn't fully understand it.”

South Carolina

- “I feel misled about the bill savings. I paid \$35 to have it installed.”
- “There was a misunderstanding about the installation fee.”

Expectations of Power Manager® Events

Surveyed participants were asked how many times Duke Energy said it would activate the Power Manager® device in a summer. About 49.3% (or 69 out of 140 in both states) of the surveyed participants didn't know how many control events to expect. A few others didn't provide a number of events but thought they would occur as needed and determined by Duke Energy.

	NC		SC	
Response	N	%	N	%
Don't Know	32	45.7%	37	52.9%
As Needed	13	18.6%	8	11.4%
Did not say	10	14.3%	9	12.9%

Peak times in summer	8	11.4%	13	18.6%
A few times	4	5.7%	0	0.0%
Rarely	2	2.9%	3	4.3%

Expectations of Monetary Incentives for Participation

Surveyed participants were asked to estimate how many dollars they would receive in bill credits for their participation in the Power Manager[®] program. The responses are in Table 7 and are varied considerably, indicating a general lack of awareness of the bill credit amounts. Many respondents (33 or 48% in NC and 32 or 46% in SC) didn't respond with an answer, and instead said they didn't know.

Table 7. Expected Yearly total of Bill Credits for Participating in Power Manager[®]

Response	NC		SC	
	N	Percent	N	Percent
Don't know	33	48%	32	46%
"\$8 per month in summer"	4	5.8%	3	4.3%
\$10-\$19	0	0.0%	2	2.9%
\$20-\$29	10	14.5%	12	17.1%
\$30-\$39	7	10.1%	15	21.4%
\$40-\$49	2	2.9%	2	2.9%
\$50-\$99	10	14.5%	3	4.3%
\$100 or more	1	1.4%	1	1.4%
Total	69	100%	70	100%

When surveyed participants were asked if they have received any bill credits for their Power Manager[®] program participation, more than three-quarters of survey respondents didn't know. Five (6.3%) respondents said that they did not get any credits when they did in fact get them on their bill (due to there being events in the summer of 2011). Only about a third of the participants noticed the bill credits for their participation.

Table 8. Did you receive bill credits this year from Duke Energy for participating in this program in 2011?

	NC		SC	
	N	Percent	N	Percent
No	36	52.2%	34	48.6%
Yes	4	5.8%	5	7.1%
Don't Know	29	42.0%	31	44.3%

Despite the uncertainty of many of the participants over bill credits and control events, few of the survey respondents indicated that anything about the program was unclear to them. Only nine (6.5%) respondents surveyed in both states had some questions about the program.

Table 9. Is anything unclear to you about how the program works?

	NC		SC	
	N	Percent	N	Percent
No	60	87.0%	65	92.8%
Yes	4	5.8%	5	7.1%
Don't Know	5	7.2%%	0	-

What respondents indicated was unclear about the program:

In North Carolina:

- “How much do we get in bill credits?”
- “How often per year they cycle off my AC?”

In South Carolina:

- “How much do we get in bill credits?” (N=2)
- “Where do the bill credits appear on the bill?”

Table 10. Did you ever call or email Duke Energy to find out more about the Power Manager® Program?

	NC		SC	
	N	Percent	N	Percent
No	68	98.5%	66	94.3%
Yes	1	1.5%	4	5.7%

The one surveyed participant in North Carolina that contacted Duke Energy to find out more about the Power Manager® program was satisfied (scores of 9 on a 10-point scale for both categories) with the ease of reaching a Duke Energy representative to discuss the program and the Duke energy representatives response to the question.,

Three of the four participants who contacted Duke Energy in South Carolina were satisfied with the ease of reaching a Duke Energy representative (scores of 9, 9 and 10 on a 10-point scale) and another was unsatisfied (a score of 1). The unsatisfied participant cited a long wait time on hold as the reason for the rating. Three respondents in South Carolina were unsatisfied (a 1, 1 and 5 on a 10-point scale) with how the representative responded to their questions. One respondent stated an inability to reach anyone from Duke Energy and another respondent stated that the Duke Energy representative was unable to resolve the issue.

Awareness and Response to Activation

More than forty percent of the surveyed respondents in both states are not aware of the Power Manager® control events when they occur either because they are not at home, or don't notice the event or the bill credits for events.

Table 11. Has Duke Energy activated the Power Manager[®] device since you joined the program?

	NC		SC	
	N	Percent	N	Percent
No	2	2.9%	1	1.4%
Yes	34	49.3%	29	41.4%
Don't Know	33	47.8%	40	57.1%

In North Carolina, 49.3% were aware of an event occurring because of the following reasons.

- Light on the AC flashes (N=21)
- The AC shuts down (N=15)
- Home temperature rises (N=15)
- Bill Credits (N=3)

In South Carolina, 41.4% were aware of an event occurring because of the following reasons.

- Light on the AC flashes (N=14)
- The AC shuts down (N=14)
- Home temperature rises (N=9)
- Bill Credits (N=1)
- Light on the meter is on (N=1)

Few participants in both states that were surveyed knew the number of control events that had occurred at the time of their survey. Some surveyed participants offered guesses; however, 77% in NC and 88% in SC reported that they didn't know. Participants were surveyed in July and August, after a time in which they would have experienced three to seven events out of a total of 8 control events that occurred in the 2011 cooling season.

Table 12. About how many times did Duke Energy activate your Power Manager[®] device during this past summer?

	NC		SC	
	N	Percent	N	Percent
One	5	6.3%	2	2.8%
Two	2	2.9%	2	2.8%
Three	1	1.4%	-	-
Four	3	4.3%	1	1.4%
Five	1	1.4%	-	-
Six	1	1.4%	-	-
Twelve	1	1.4%	1	1.4%
Twenty to Thirty	1	1.4%	-	-
Several	2	2.9%	1	1.4%
Don't Know	53	76.8%	62	88.6%

Most participants do not know how many times their units have been activated, with many not knowing if they have been activated at all. However, fifty (72.5%) of the surveyed participants in North Carolina, and sixty-four (93.7%) of the surveyed participants in South Carolina report that someone is usually home on weekday afternoons and in the summer and using the air conditioner.

When TecMarket Works asked the participants if they were home during any of the control events, most did not know, but some (22% in NC and 10% in SC) said that they were home during at least one of the events.

Table 13. Were you or any members of your household home when Duke Energy activated your Power Manager® device this past summer?

	NC		SC	
	N	Percent	N	Percent
No	5	7.2%	1	1.4%
Yes	15	21.7%	7	10%
Don't Know	49	71%	62	88.6%

TecMarket Works then asked the 15 respondents in North Carolina and seven respondents in South Carolina who reported being at home during control events to think back to the event time and then to rate their comfort before and during the event on a 1-to-10 scale with 1 being very uncomfortable and 10 being very comfortable.

Table 14. North Carolina Comfort ratings before and during control events

Participant	Rating before event	Rating during event	Difference
1	10	8	2
2	9	8	1
3	9	8	1
4	10	10	0
5	9	7	2
6	9	9	0
7	9	8	1
8	9	9	0
9	7	6	1
10	9	7	2
11	9	8	1
12	10	4	6
13	10	8	2
14	10	8	2
15	8	7	1
Mean	9.1	7.7	1.5
Median	9	8	1

In North Carolina, three of the 15 reported no difference in comfort as a result of the event. When considering only the 11 respondents whose in-event rating was lower than the pre-event rating, the average difference in ratings is 1.9 with a median of 2.

Table 155. South Carolina Comfort ratings before and during control events

Participant	Rating before event	Rating during event	Difference
1	10	9	1
2	9	9	0
3	9	7	2
4	9	8	1
5	9	5	4
6	9	8	1
7	9	8	1
Mean	9.1	7.7	1.4
Median	9	8	1

In South Carolina, one of the seven reported no difference in comfort as a result of the event. When considering only the six respondents whose in-event rating was lower than the pre-event rating, the average difference in ratings is 1.7 with a median of 1.

Eight respondents (73%) in North Carolina and all six respondents in South Carolina that indicated that they felt uncomfortable during the periods of activation indicated that they felt their discomfort was a direct result of the Power Manager[®] control unit activation.

All of the respondents in both states indicated that a higher temperature was causing their discomfort.

One participant in North Carolina also cited a rise in humidity, and one participant in North Carolina also cited a power outage.

TecMarket Works then asked the respondents if they recalled doing anything to keep cool during the control event. Four respondents in North Carolina and three respondents in South Carolina recalled trying to keep cool using the following methods.

North Carolina

- Adjusted Temperature (N=2)
- Wore less clothing
- Left the house and went somewhere cool

South Carolina

- Adjusted Temperature
- Wore less clothing and drank more cool drinks

- Don't Know

Reasons for the Power Manager® Program and Events

We asked the surveyed participants the following question: "Why do you think Duke Energy activates your Power Manager® device on summertime weekdays during the afternoon as opposed to other times of the day or year?" The responses are presented in Table 16. Half of the of the respondents across both states mentioned peak demand or load control in their answer.

Table 16. Perceived Reasons for Power Manager®

	NC		SC	
Reasons mentioned	N	Percent	N	Percent
Peak Demand	35	52.2%	33	48.5%
Hottest time of day	8	11.9%	15	22.1%
Fewer people are home	15	22.4%	9	13.2%
Don't Know	9	13.4%	11	16.2%

Program Satisfaction

Surveyed respondents indicate a high level of satisfaction with the enrollment process of the Power Manager® program. North Carolina participants report a mean satisfaction score of 9.6 and South Carolina participants report a mean satisfaction score of 9.4 with the enrollment process on a scale of 1 to 10 with 10 meaning they were very satisfied.

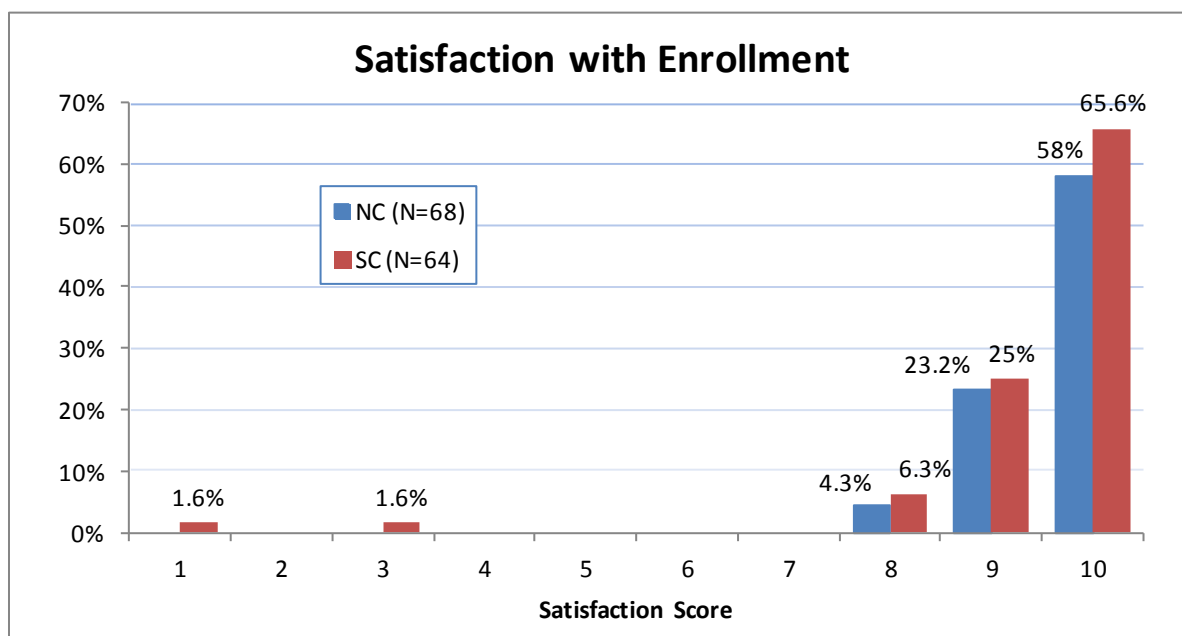


Figure 8. Satisfaction with Power Manager's® Enrollment Process

The following are the reasons for participants reporting low (score of 8 or less) satisfaction scores with the program enrollment. These scores indicate that the customers, who scored satisfaction low, typically do not have a reason for that lower enrollment satisfaction score. All responses are from South Carolina participants.

- “I didn't get enough information about it.”
- “After a house fire, a Duke contractor removed the device and so I had to re-enroll, which took several weeks.”
- “I didn't know about the \$35 installation fee until I got my next bill. I feel misled.”

Overall program satisfaction scores for Power Manager[®] are also high with an average of 9.3 in both states. Additionally, more than 79% of the survey respondents in both states report a satisfaction score of 9 or 10 with the Power Manager[®] program.

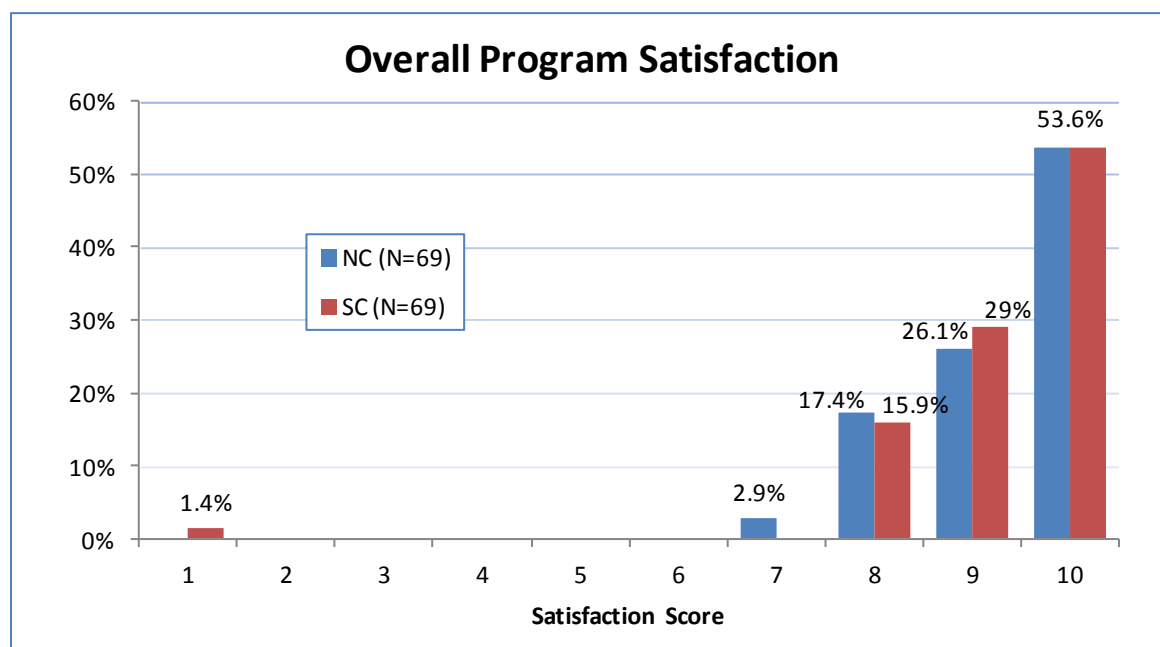


Figure 9. Overall Program Satisfaction

The following are the reasons for participants reporting low (score of 8 or less) satisfaction scores with the program overall.

North Carolina:

- “The bill credits/incentives were not large enough.” (N=2)
- “I was uncomfortable when my Power Manager device was activated.” (N=2)

South Carolina:

- “The bill credits/incentives were not large enough.” (N=3)
- “Duke should have been clearer about the fee up front.”

The overwhelming majority of surveyed participants (95.6% in NC and 94.2% in SC) would recommend the Power Manager[®] program to others. Two of the surveyed participant who said they would not recommend the program offered the following reasons:

- “Poor payback”
- “I don’t have any reason to recommend it.”

Awareness of Other Duke Energy Programs

We asked the surveyed participants if they were aware of any other Duke Energy programs. Fifty-three (76.8%) of the participants in North Carolina and forty-five (64.2%) of the participants in South Carolina were able to name other programs, and the most cited programs were the Home Energy House Call Program and the CFL Program.

	NC (n=69)		SC (N=70)	
	N	Percent	N	Percent
CFL Program	31	44.9%	35	50.0%
Home Energy House Call	16	23.2%	9	12.9%
Personalized Energy Report	1	1.4%	1	1.4%
Smart \$aver	0	0.0%	-	-
Energy Star Homes	3	4.3%	3	4.3%
Low Income Programs	3	4.3%	1	1.4%
Home Energy Comparison Report	1	1.4%	-	-
Water heater control device	3	4.3%	1	1.4%
Go Green	1	1.4%	-	-
Total	59	85.5%	50	66%

Air Conditioner Practices

We asked the surveyed participants about their air conditioning use. First we asked if they used their air conditioner only on the hottest days of the cooling season, or if they used it frequently, most days, every day, or not at all. The Power Manager[®] program in the Carolinas is successful in enrolling participants that routinely use their air conditioners on the hottest days, but also use their units most of the cooling season. The program is reaching and enrolling the customers that typically and routinely use their units on control days. None of the respondents in the Carolinas indicated that they never use their air conditioner.

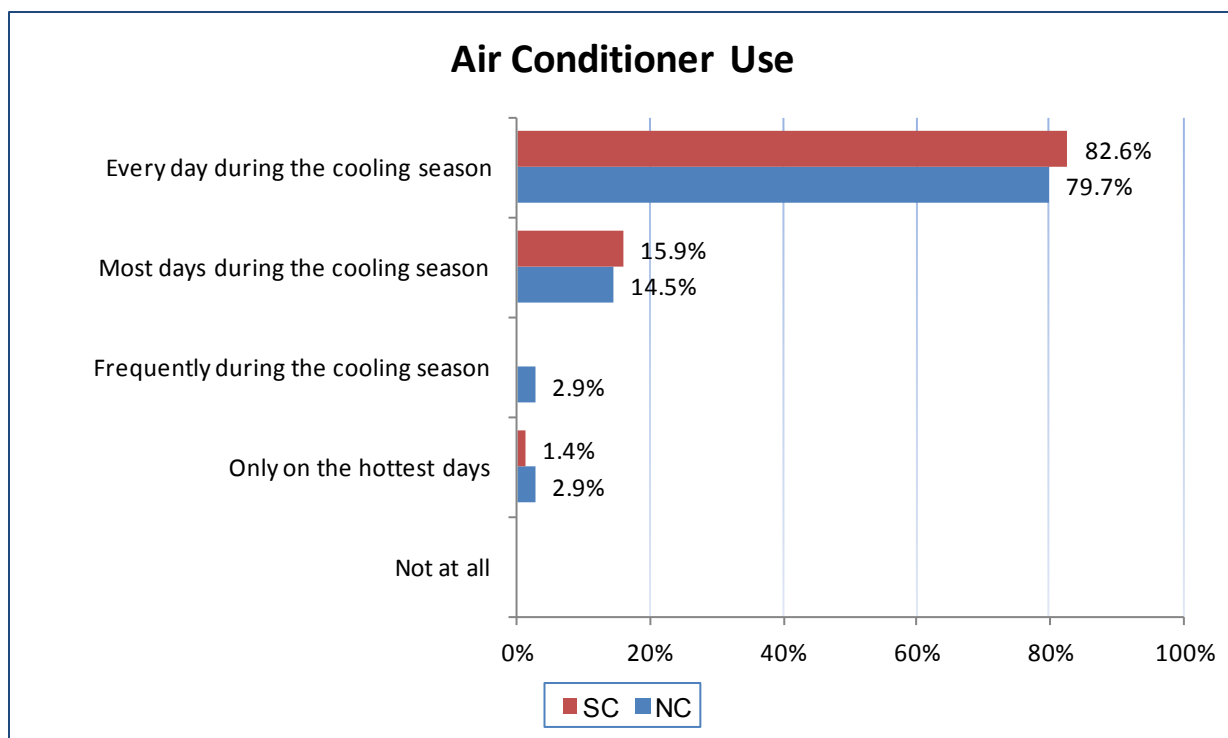


Figure 10. Air Conditioner Use of Power Manager[®] Participants

We then asked the surveyed participants to estimate how many days they had their air conditioners on during the summer of 2011 previous to taking the survey. These results are presented in Figure 11. These results match closely to the estimates provided in Figure 10, and a large majority of respondents in both states report using their air conditioner every day during the cooling season.

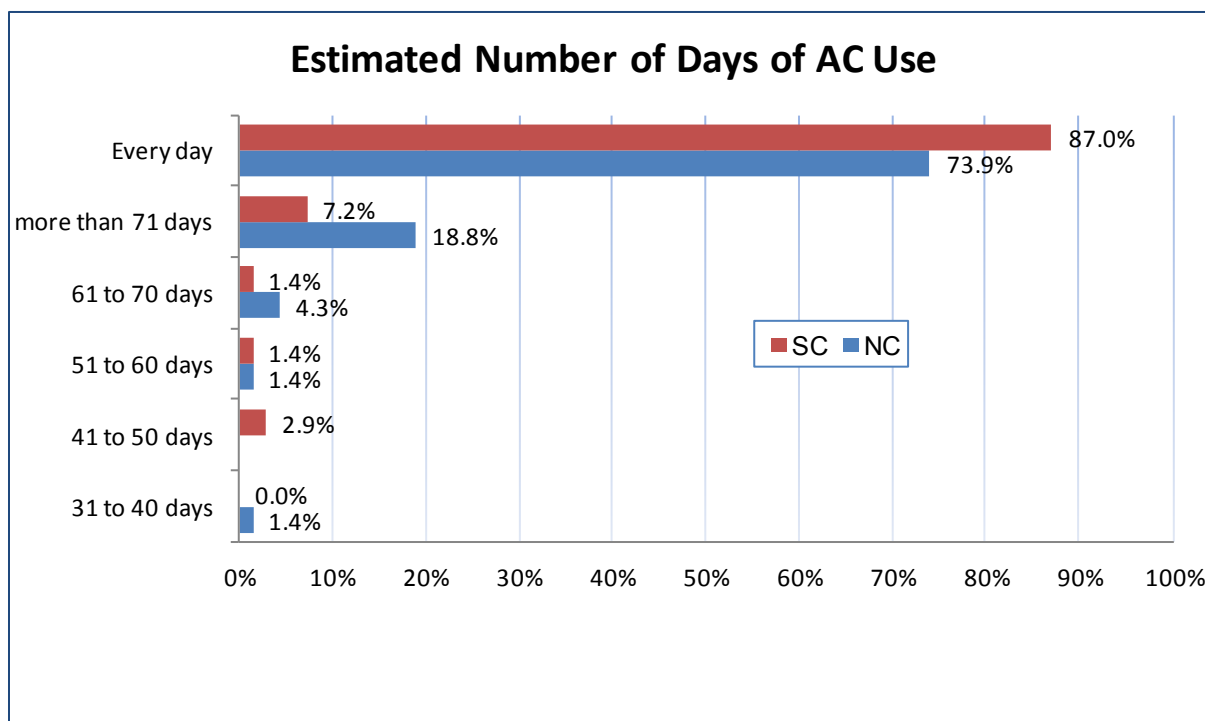


Figure 11. Estimated Number of Days of Air Conditioner Use, Summer 2011 (N=69 for both states).

Seventy-five percent of North Carolina participants that were surveyed reported that they had someone tune-up or repair their air conditioner in the time since they enrolled in the Power Manager[®] program. Similarly, seventy-one percent of South Carolina participants reported an air conditioner tune-up.

Table 17. Respondents Receiving AC Services (tune-up or repair) Since Enrolling in Power Manager[®]

	NC		SC	
	N	Percent	N	Percent
No	16	23.2%	19	27.5%
Yes	52	75.4%	49	71.0%
Don't Know	1	1.4%	1	1.4%

Forty-nine of the surveyed participants (94%) in North Carolina and forty-seven (96%) in South Carolina had their air conditioner serviced by an AC contractor, two participants in North Carolina and two participants in South Carolina noted that they had self-serviced their AC and one participant in North Carolina could not remember who had serviced their air conditioner.

We then asked participants if the performance of their air conditioner improved following the tune-up or repair. Slightly more than half of those who had their AC serviced report that the performance of the AC unit did improve as a result.

Table 18. Did the performance of your air conditioner improve after you had it serviced?

	NC		SC	
	N	Percent	N	Percent
No	21	36.8%	19	38.8%
Yes	30	57.7%	25	51%
Don't Know	1	1.8%	5	10.2%

Surveyed participants report that there is usually someone at the home and using the air conditioner on weekday summer afternoons in 72.4% and 92.8%% of homes in North Carolina and South Carolina respectively.

Table 19. Is the air conditioner typically used to keep someone at home comfortable during weekday summer afternoons BEFORE 5 P.M.?

	NC		SC	
	N	Percent	N	Percent
No	19	27.6%	5	7.2%
Yes	50	72.4%	64	92.8%

Table 20. Is the air conditioner typically used to keep someone at home comfortable during weekday summer afternoons AFTER 5 P.M.?

	NC		SC	
	N	Percent	N	Percent
No	3	4.3%	0	0
Yes	66	95.7%	69	100%

Outside Temperatures and Thermostat Settings

Surveyed Power Manager[®] participants were asked to think about a hot and humid summer day, and then to tell us at what outside temperature they start to feel uncomfortably warm. The responses are presented in Figure 12. The median temperature range of discomfort is 85-87°F in North Carolina and 88-90°F in South Carolina.

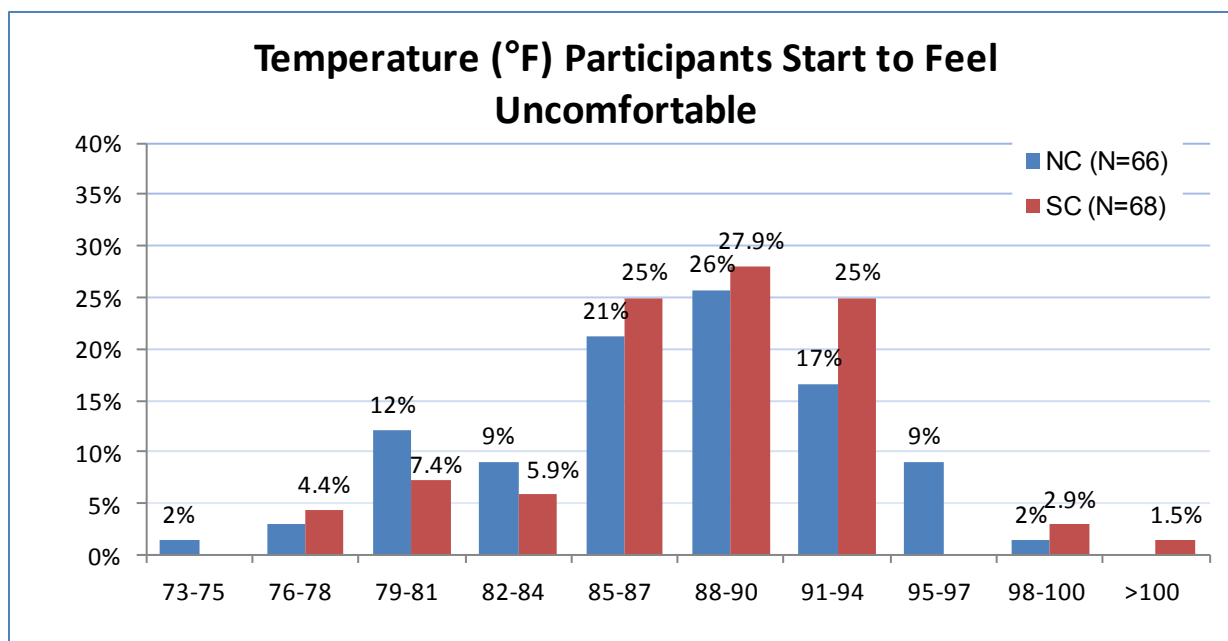


Figure 12. Outside Temperatures at Which Participants Feel Uncomfortably Warm

We then asked the surveyed participants at what outside temperature they tend to turn their air conditioners on. The median outside temperature range for which air conditioners are turned on is 82-84°F in both states (two ranges lower than the discomfort level in South Carolina and one range lower than the discomfort level in North Carolina). The frequency of responses are presented in Figure 13.

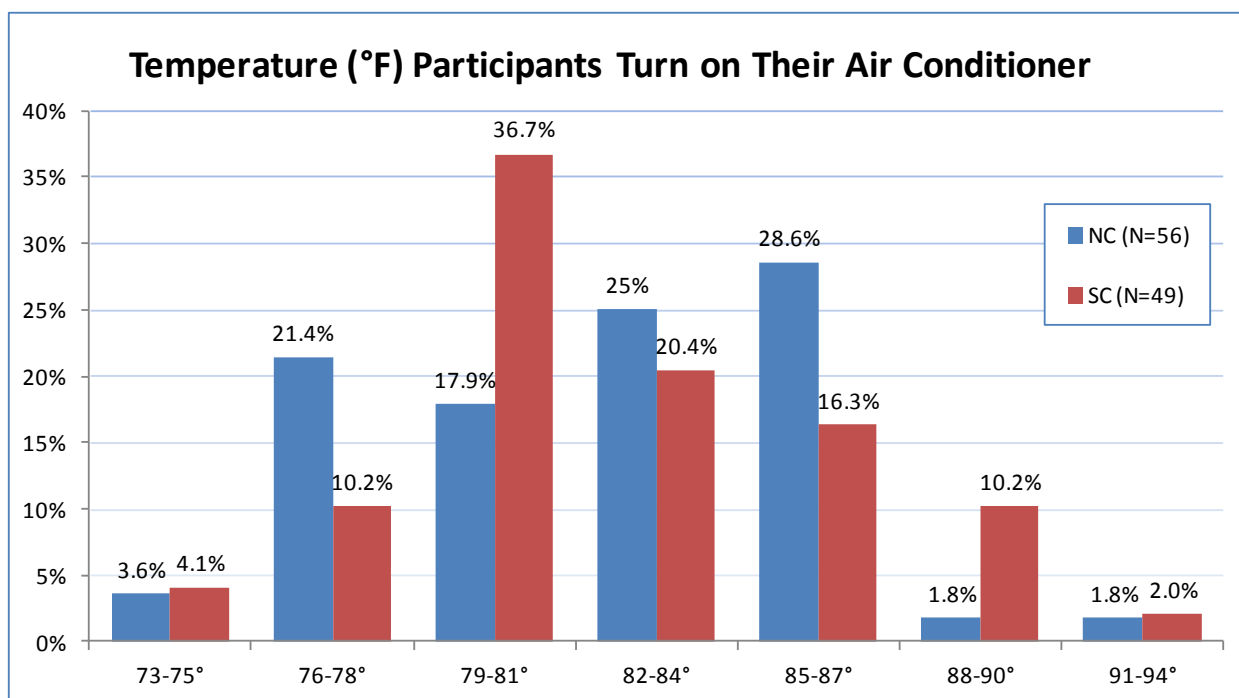
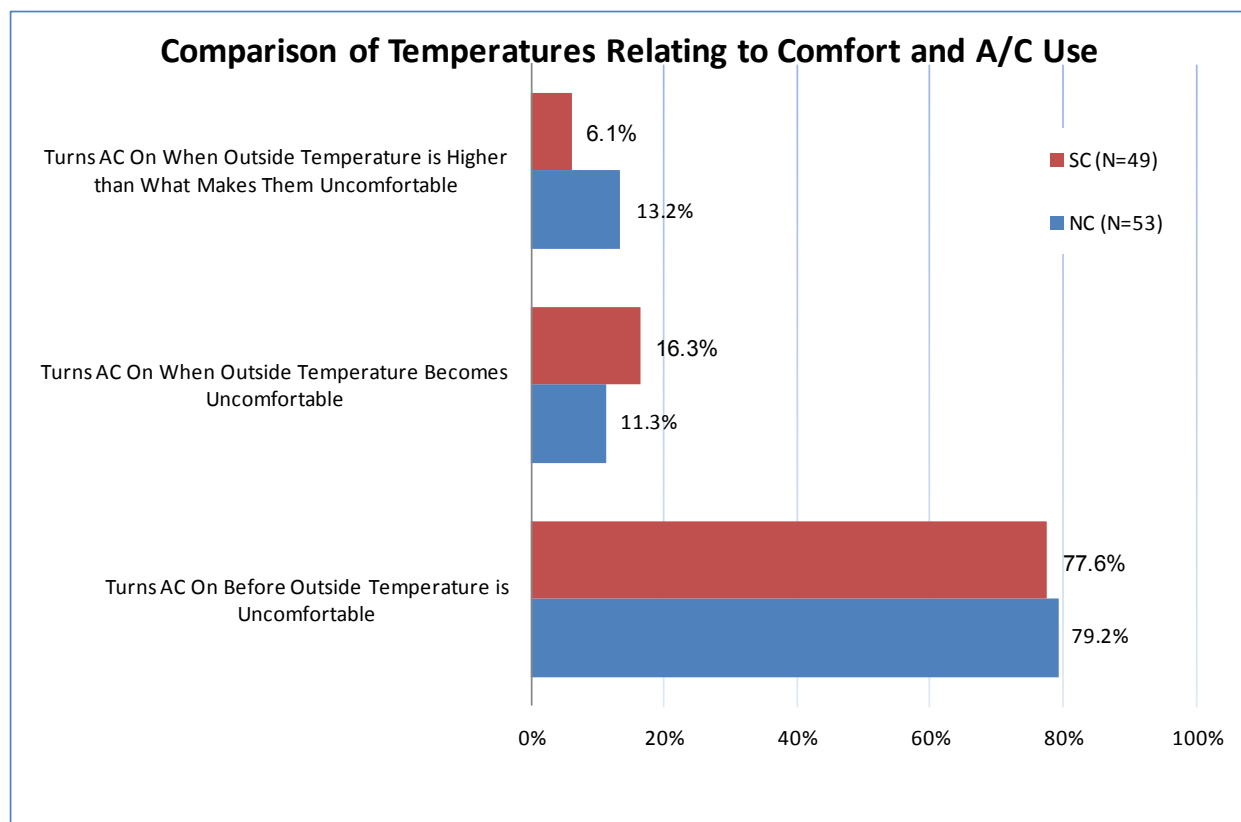


Figure 13. Outside Temperatures at which Participants Turn On Their Air Conditioners

Comparing these two temperature points (of discomfort and when participants turn on their air conditioners) provides us with Figure 14, which shows that more than three-quarters of participants in both states turn on their air conditioners before the temperature becomes uncomfortable, sixteen percent of respondents in South Carolina and 11% of respondents in North Carolina turn it on when the weather becomes uncomfortable, and some (6.1% in South Carolina and 13.2% in North Carolina) respondents wait until the temperature is higher than when they begin to feel uncomfortable.

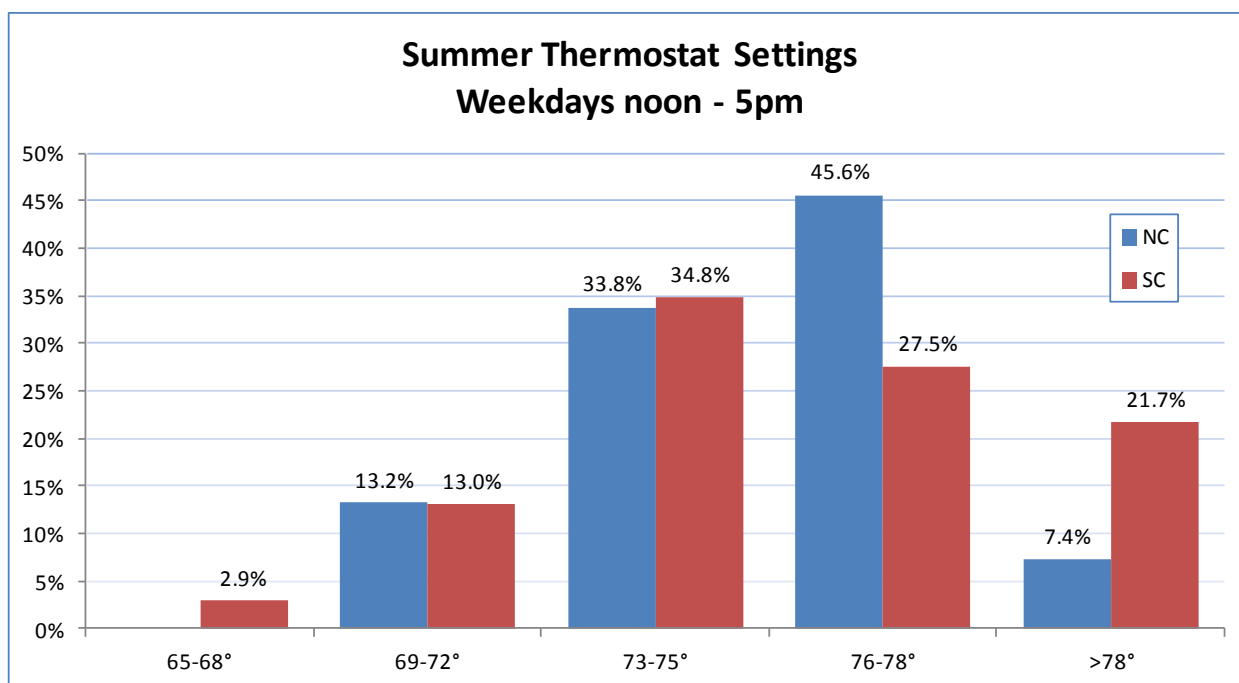
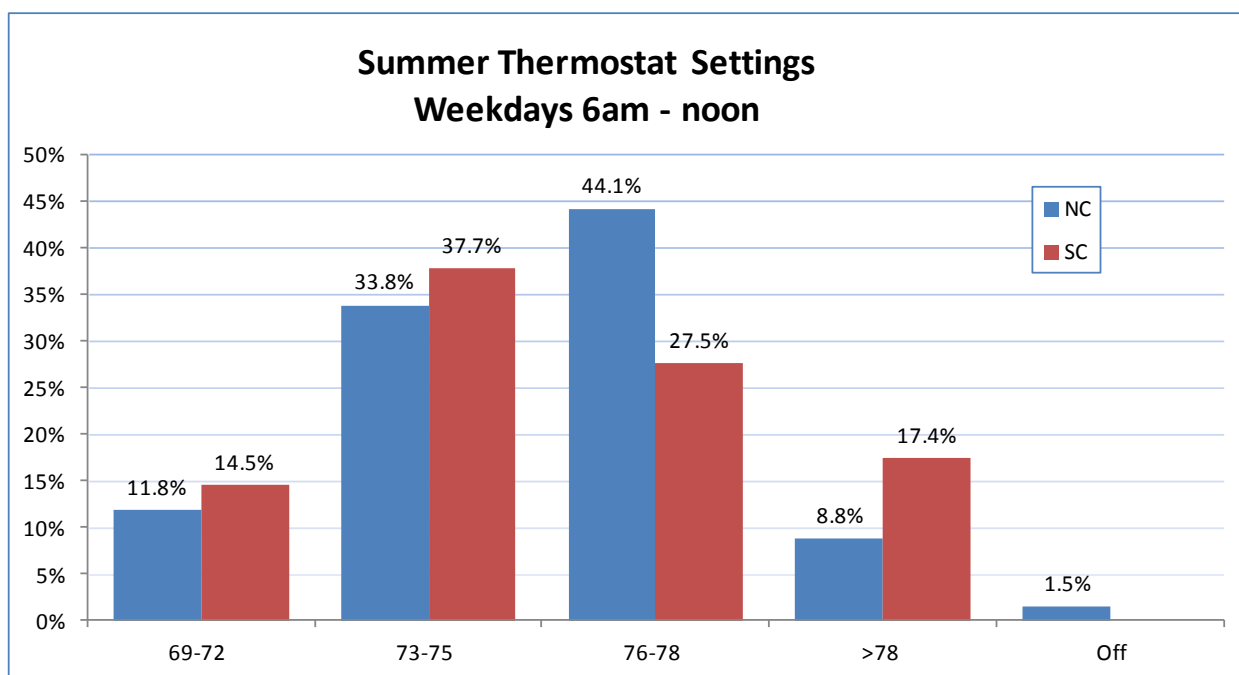
**Figure 14. Percent of Participants Turning Their Air Conditioners When Temperatures Reach an Uncomfortable Level**

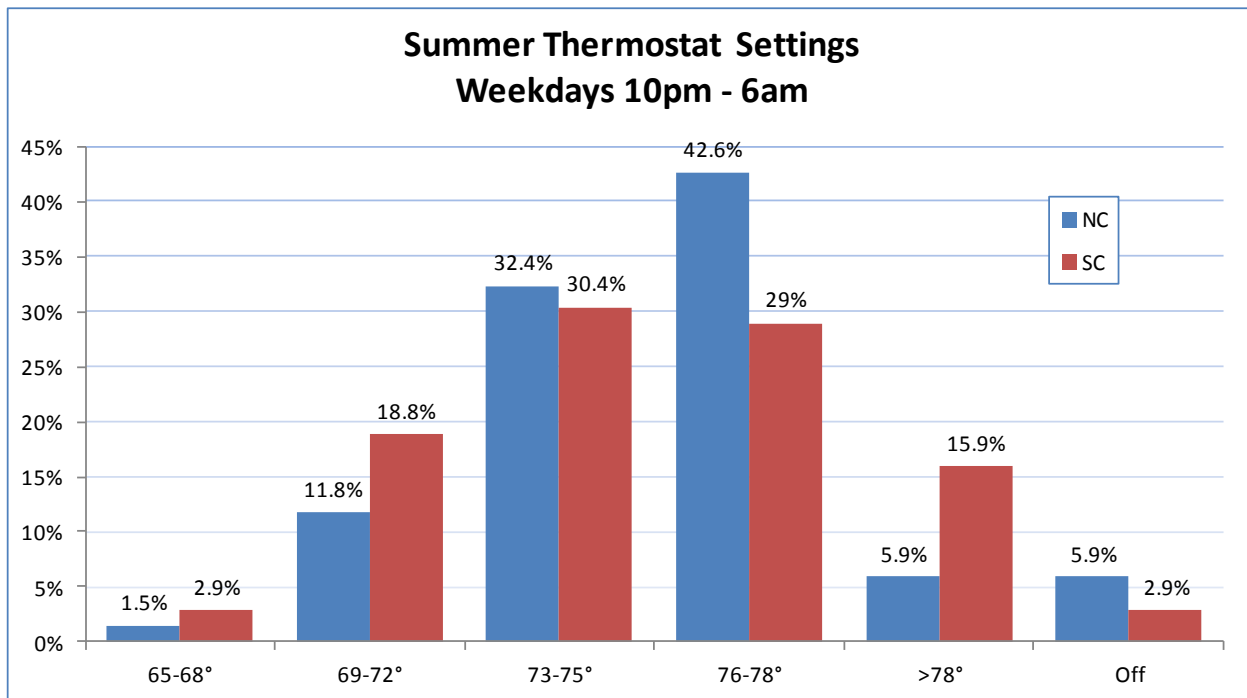
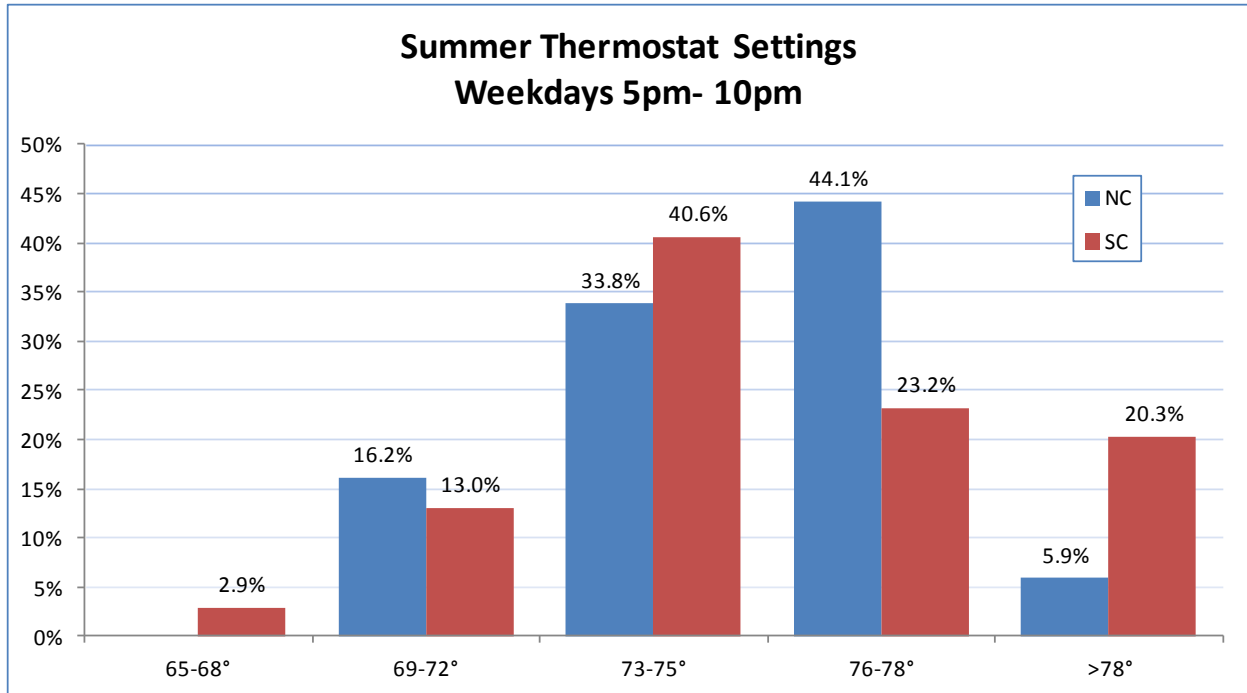
If the respondent indicated that the AC is turned on at a certain temperature through their programmed thermostat, we asked the participant if they set the thermostat seasonally or if they set it when the weather gets hot. The majority of surveyed participants in both states indicated that they program the thermostat seasonally.

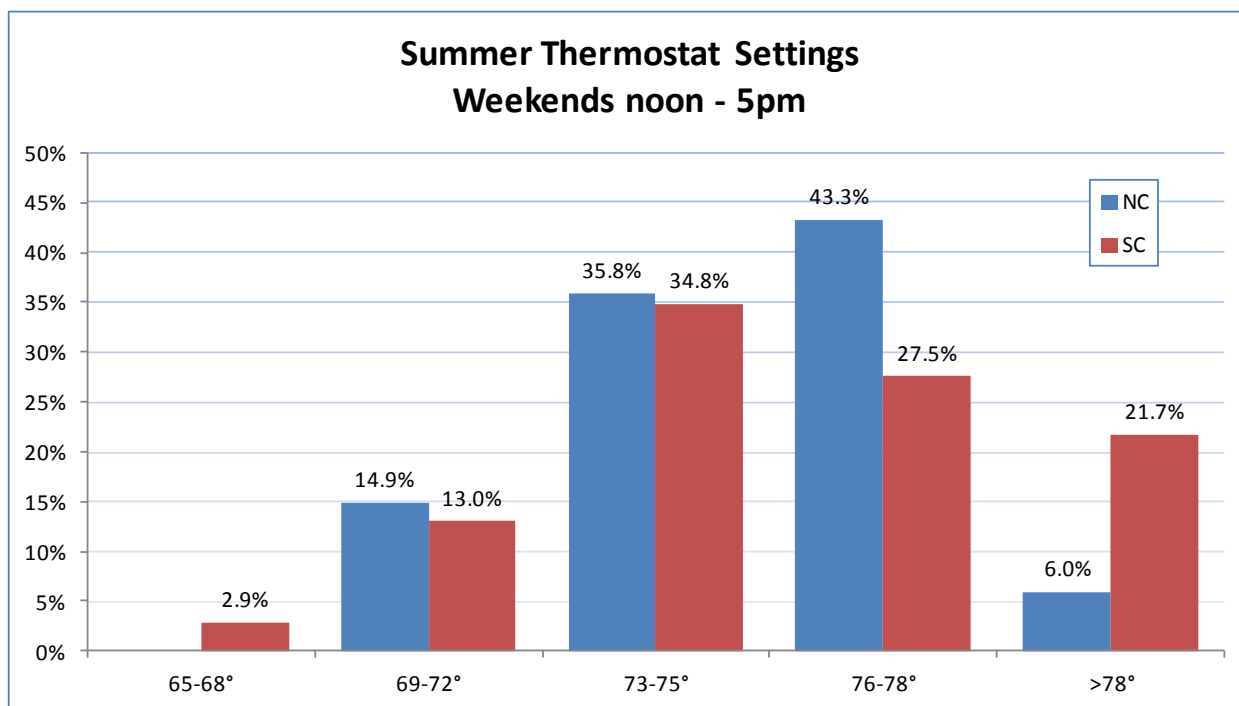
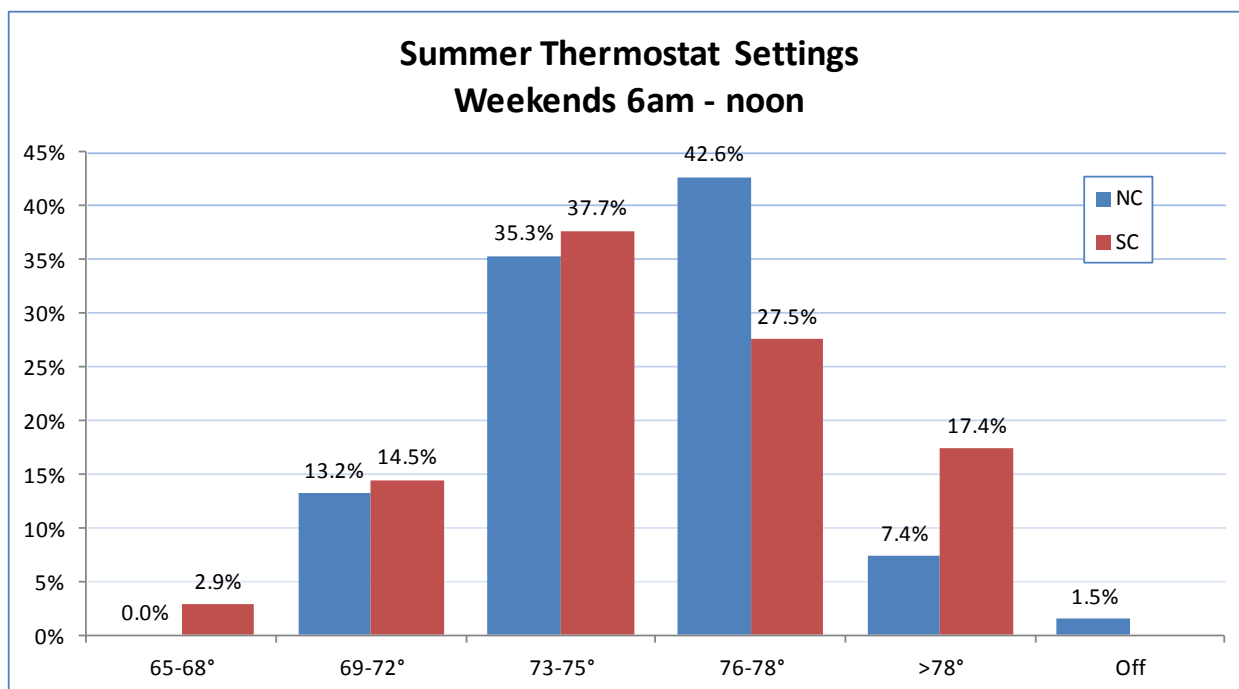
	NC		SC	
	N	Percent	N	Percent
I program the thermostat seasonally	10	90.9%	15	88.2%
When the weather gets hot	1	9.1%	2	11.8%

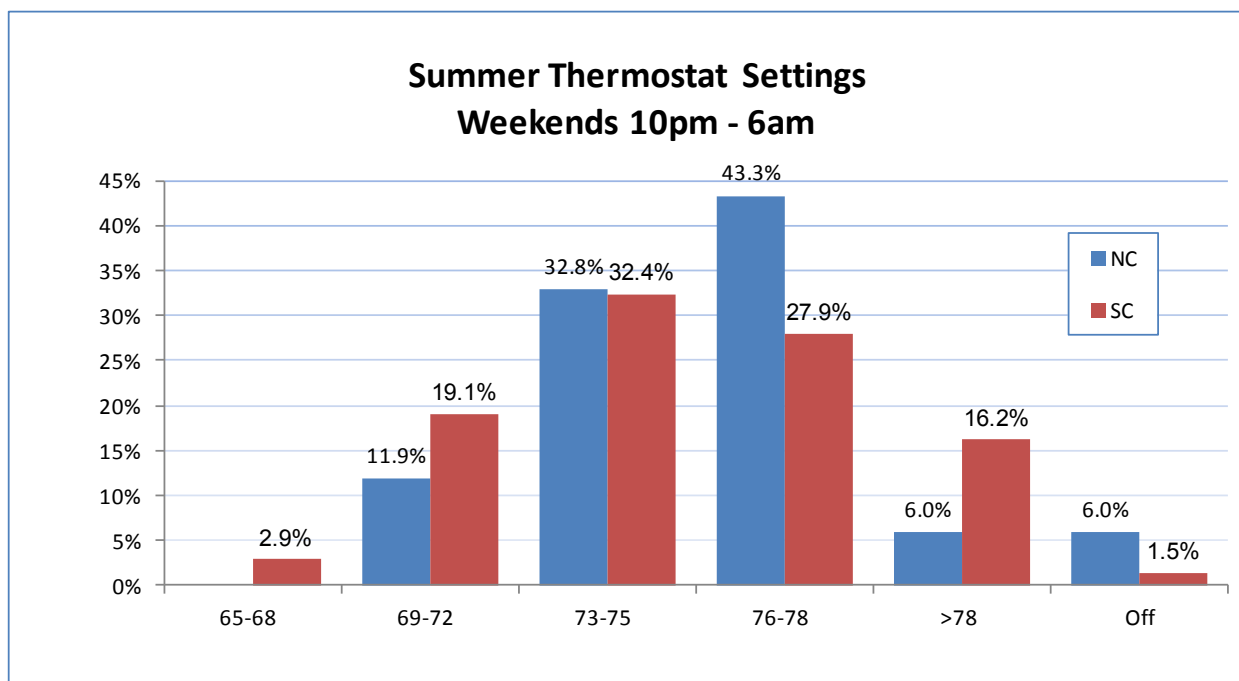
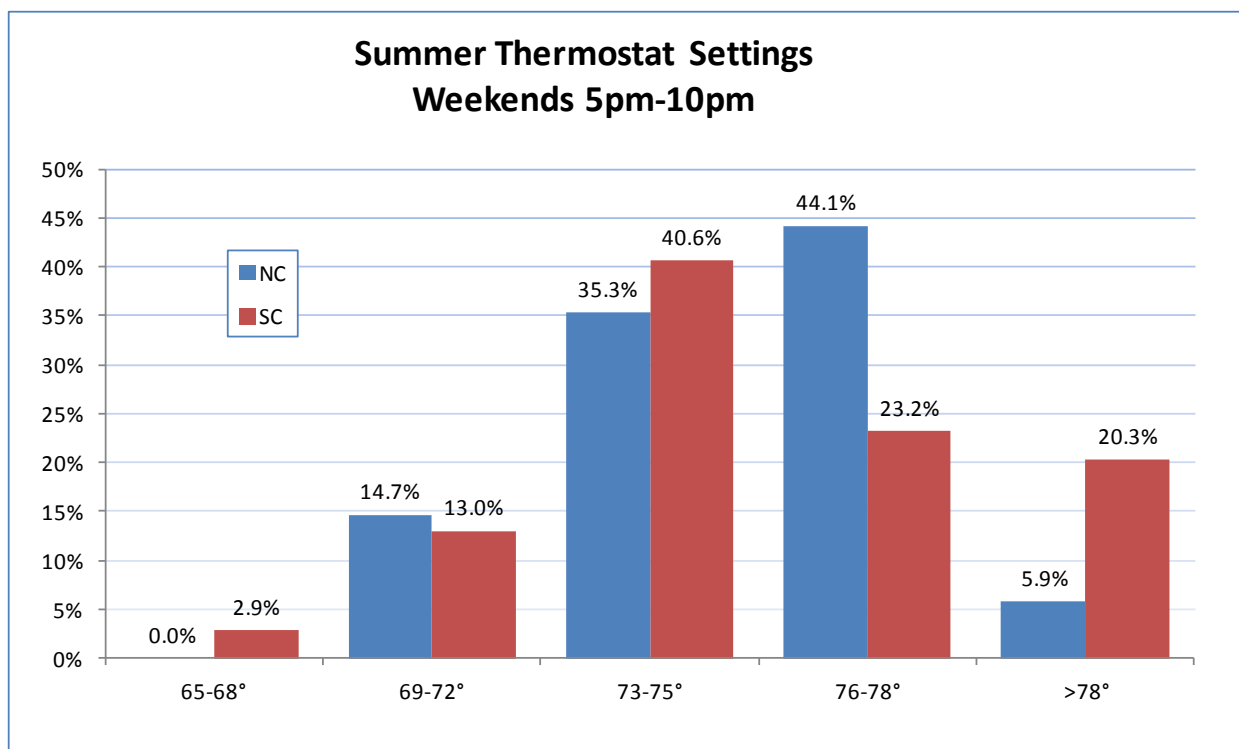
Thermostat Settings

The following graphs present the frequencies of thermostat settings of the Carolinas surveyed participants on weekdays and weekends at four time periods throughout the day (6am-12pm, 12pm-5pm, 5pm-10pm, and 10pm-6am). All eight of these graphs show that the most common thermostat setting over all days and time periods is 76-78°F in North Carolina and 73-75°F in South Carolina.









All of the Power Manager[®] participants in South Carolina indicated that they set their thermostat the same regardless of whether it is a weekday or weekend.

Some North Carolina participant indicated that they turn down their thermostat temperature (using more energy) during the day (6 am.-5 p.m.) on weekends. Additionally, two respondents

in North Carolina are also likely to turn on their AC from 6 a.m. to 5 p.m. every day and turn it off the rest of the time.

Table 21. Changes in Thermostat Settings of North Carolina Power Manager[®] Participants from weekday to weekend

Time period	NC (N=68)		
	Same every day	Lower AC temperature on weekends	Higher AC temperature on weekends
6am-12pm	97.1%	2.9%	0.0%
12pm-5pm	95.6%	4.4%	0.0%
5pm-10pm	100%	0%	0.0%
10pm-6am	100%	0%	0.0%

We found that there are two types of customers in the Power Manager[®] participant group in the Carolinas: those that turn their air conditioners on to a set temperature and leave it at that temperature all day, every day (non-adjusters), and those that change the temperature settings either during the day for between weekends and weekdays (adjusters). Figure 15 below shows that three quarters the surveyed Power Manager[®] participants in both states are "non-adjusters". One quarter of participants in each state adjust their thermostat settings at some point during the week.

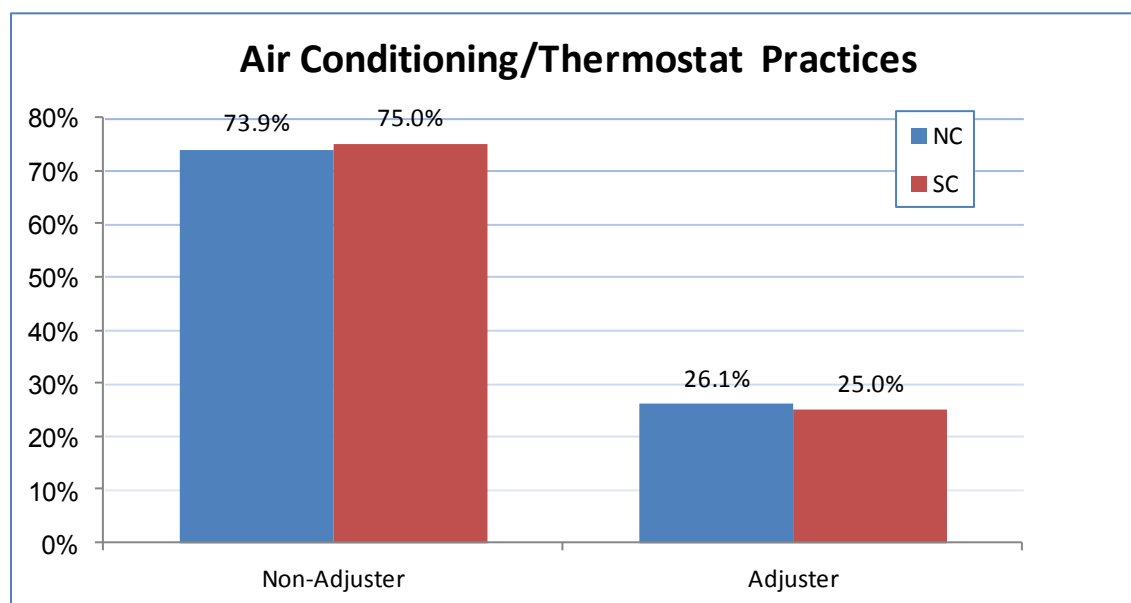


Figure 15. Thermostat Practices of Power Manager[®] Participants

We split the surveyed participants into these two groups to calculate the outside temperature points at which they become uncomfortable and turn on their air conditioners.

When both states are combined, adjusters and non-adjusters both become uncomfortable when the outside temperature reaches 88-90°F, and will turn their air conditioners on when the outside temperature reaches 82-84°F.

Satisfaction with Duke Energy

Overall satisfaction with Duke Energy is quite high. North Carolina participants report an average satisfaction score of 8.9 on a ten-point scale with a median score of nine. In South Carolina, the average satisfaction score is 9.2 with a median score of ten. The frequency of responses is presented in Figure 16.

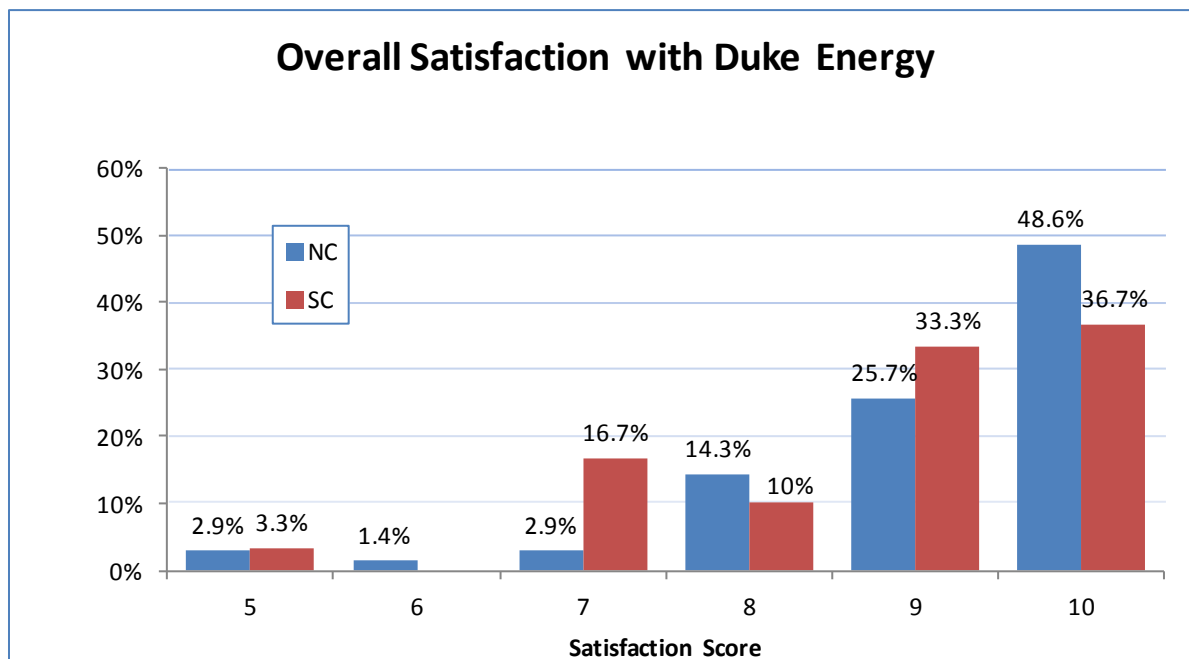


Figure 16. Overall Satisfaction with Duke Energy

Surveyed participants that gave a satisfaction score lower than 9 were asked why they were less than satisfied with Duke Energy. Their responses are below.

North Carolina:

- “Rates are too high.” (N=6)
- “Too many power outages.” (N=5)
- “Poor customer service.” (N=3)
- “Delays in restoring power following outages.” (N=3)
- “Low quality tree trimming.”
- “I do not like the automated phone service.”

South Carolina:

- “Rates are too high.” (N=8)
- “Poor customer service.” (N=2)

- “Too many outages.” (N=2)
- “Delays in restoring power following outages.”(N=2)
- “Tree-trimming issues.”(N=2)

Section 3: Recency Surveys

In addition to the participant surveys reported above, TecMarket Works also conducted surveys of current Power Manager participants in order to better gauge their awareness of Power Manager events and their perception of discomfort caused by Power Manager curtailment events.

TecMarket Works conducted the recency surveys regarding each event during a 50-hour window beginning at 5 p.m. EST on the day that a curtailment event occurred and ending at 7 p.m. EST two days after the curtailment event. Calling hours were 9 a.m.-7 p.m. EST. Following events occurring on June 21, July 11, July 12, July 20 and August 2, TecMarket Works surveyed a total of 103 participants in North Carolina and 130 participants in South Carolina. The event survey protocol is located in Appendix C: Participant Recency Survey. Of the 233 contacted, 230 were able to complete the survey.

In order to control for customer perceptions and experiences not caused by Power Manager curtailment events, TecMarket Works also surveyed participants referencing days on which the heat index was high enough to trigger a curtailment event, but on which no curtailment event actually occurred. On and following the high temperature dates of July 11, July 28-29 and September 2, TecMarket Works surveyed a total of 50 participants in North Carolina and 61 participants in South Carolina. The high temperature non-event survey is located in Appendix D: Participant Recency Survey for Non-Event Day Comparison.

Awareness of Device Activation

In order to gauge awareness of the Power Manager device activation, TecMarket Works first asked event and non-event participants if they were aware of a device activation occurring since they had joined the program. The results in Figure 17 show that a majority of event and non-event participants were not aware of an activation at some point since their enrollment. Furthermore, the distribution of answers is quite similar between event and non-event participants.

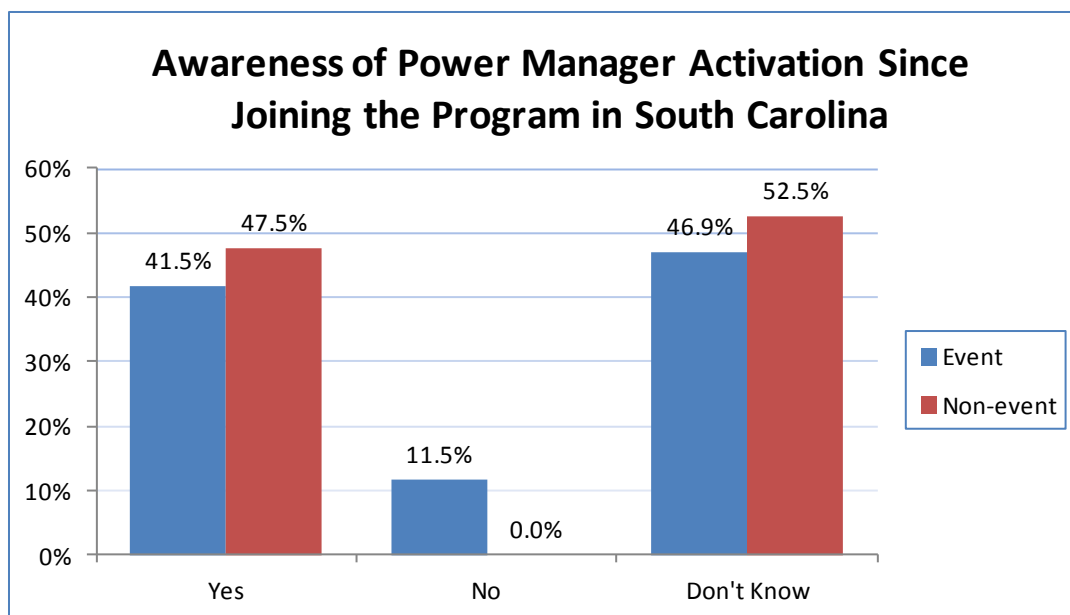


Figure 17. Awareness of Power Manager Activation Since Enrolling in the Program in South Carolina

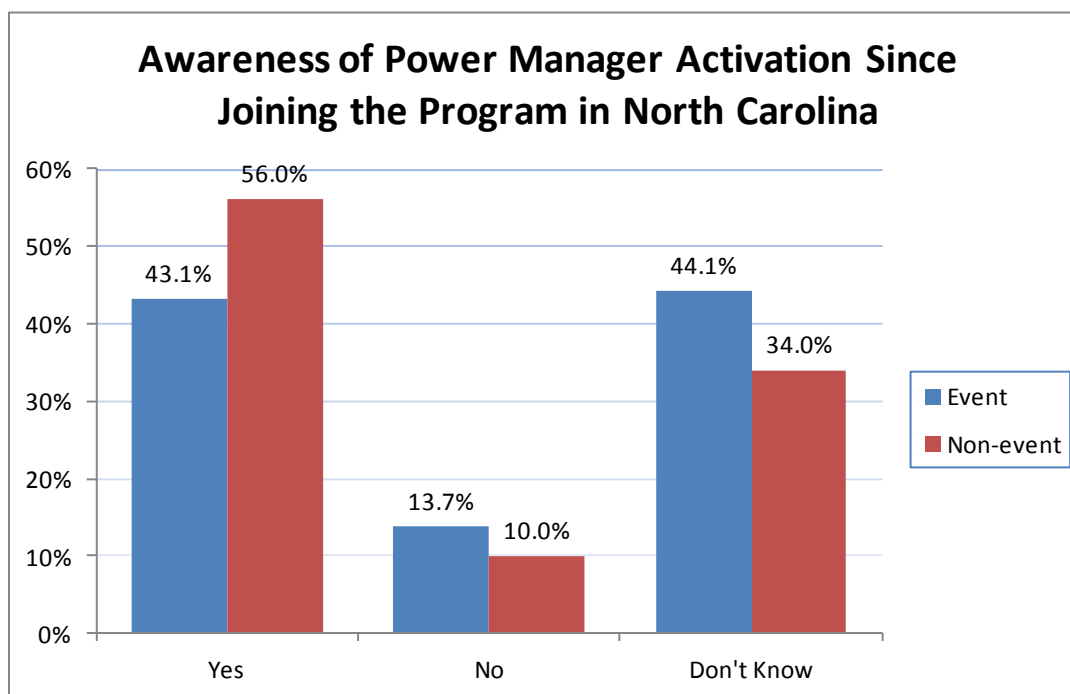


Figure 18. Awareness of Power Manager Activation Since Enrolling in the Program in North Carolina

TecMarket Works followed up the initial awareness question by asking participants an open-ended question as to how they knew that the Power Manager device had been activated. Fifty-eight event participants (46%) in North Carolina and eighty-one event participants in South

Carolina (59%) stated that they did not know how to tell if the Power Manager device had been activated. The responses from the remaining participants in Table 22 below show that the shut-down of the A/C compressor and a rise in home temperature are the most cited reasons for awareness of a Power Manager device activation.

Table 22. Reasons for Awareness of Activation in North Carolina

	Number of times mentioned by...		Difference
	Event Participants (N=103)	Non-Event Participants (N=50)	
A/C shuts down	28.2%	50%	-21.8%
Home Temperature rises	28.2%	12%	16.2%
The light on the meter is on	2.9%	2%	0.9%
The light on the A/C unit flashes	2.9%	2%	0.9%
Bill Credits	1.9%	1.6%	0.3%
Don't Know	56.3%	40%	16.3%

Table 23. Reasons for Awareness of Activation in South Carolina

	Number of times mentioned by...		Difference
	Event Participants (N=131)	Non-Event Participants (N=61)	
A/C shuts down	24.6%	16.4%	8.2%
Home Temperature rises	28.5%	26.2%	2.3%
The light on the meter is on	0%	3.3%	-3.3%
The light on the A/C unit flashes	4.6%	14.8%	-10.2%%
Bill Credits	5.4%	6.6%	1.2%
Don't Know	62.3%	50.8%	-11.5%

TecMarket Works then asked both event and non-event participants whether they were aware of their Power Manager device being activated in the last seven days. However, in the case of the non-event participants, such an activation had not occurred. This fact is supported by the results in Figure 19 and Figure 20. In Figure 19, forty percent of event respondent were aware of a Power Manager activation, while Figure 20 shows that 87 percent of non-event participants thought that no power manager activation had occurred, or were unsure of whether an activation had occurred or not.

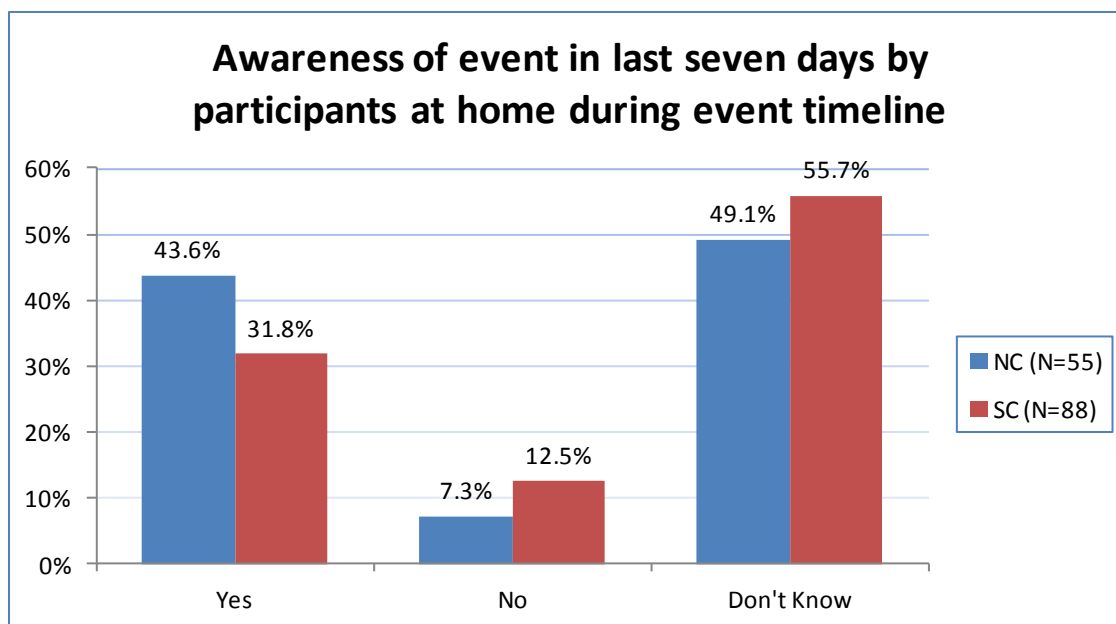


Figure 19. Awareness of activation in past seven days by event participants

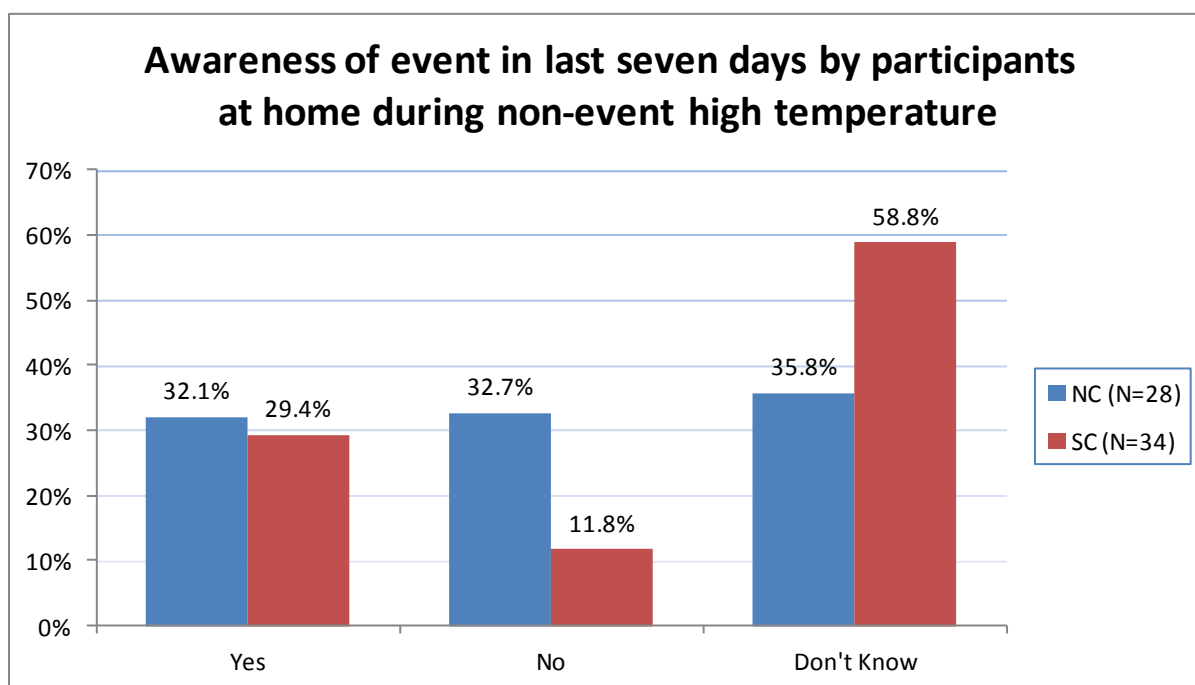


Figure 20. Awareness of event in last seven days by non-event participants.

TecMarket Works also asked event participants who were not at home during the event timeframe whether they were aware of the Power Manager device activation. As shown in Figure 21, ninety-two percent of event participants stated either that they thought no activation had occurred or were unsure of whether an activation had occurred or not. This suggests that the effects of a Power Manager activation do not persist beyond the event timeframe.

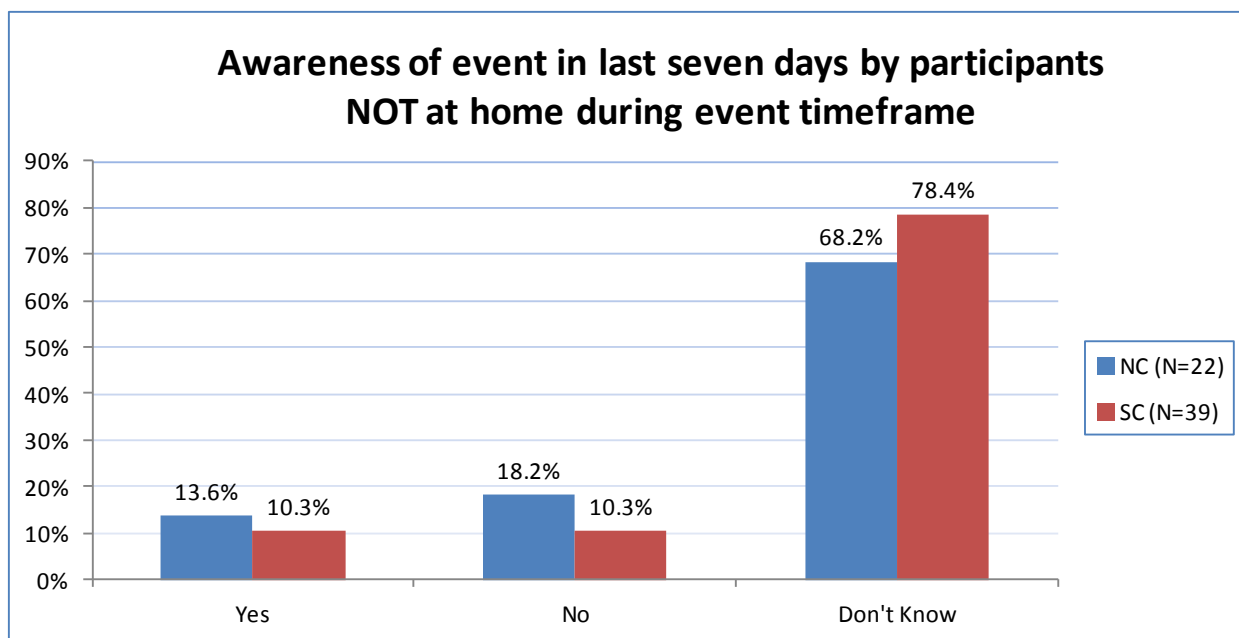


Figure 21. Awareness of event activation by event participants not at home.

Home Occupancy During Power Manager Activation

TecMarket Works then asked Event respondents whether they were home during the actual event timeframe (typically 2-5pm EST) and asked Non-Event survey respondents if they were home at 3pm EST on the date of the high temperature. The results in Figure 22 and Figure 23 show that roughly two-thirds of both event and non-event survey respondents were home during these times.

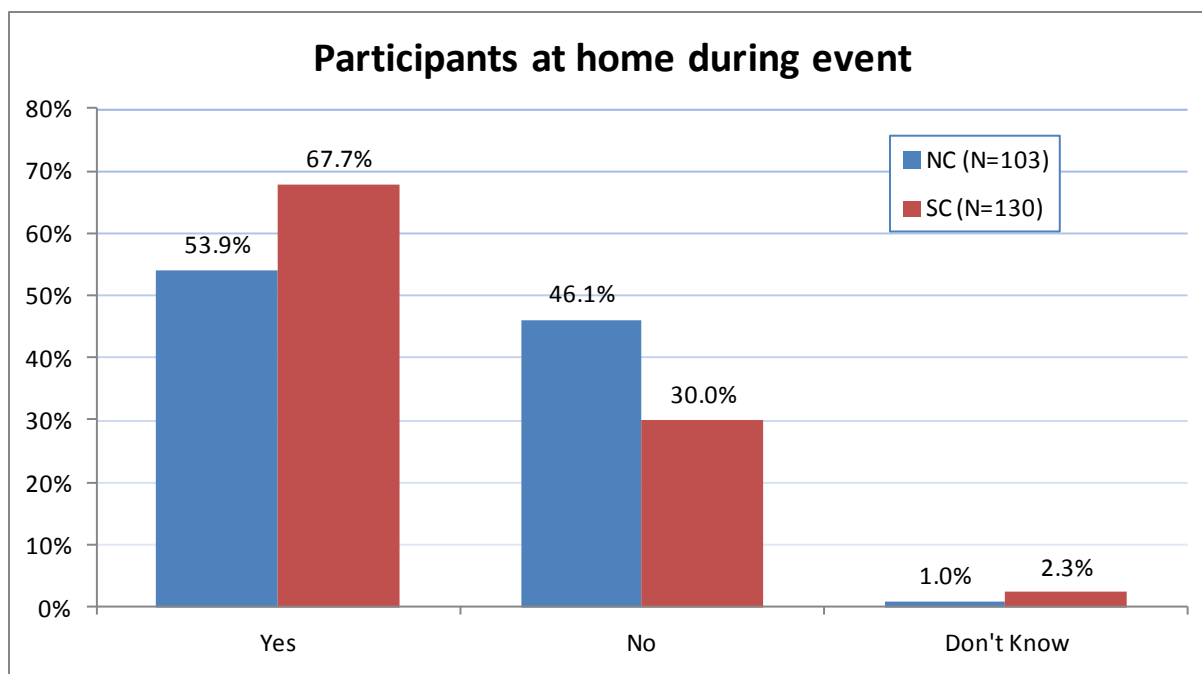


Figure 22. Event Participants at home during event timeframe.

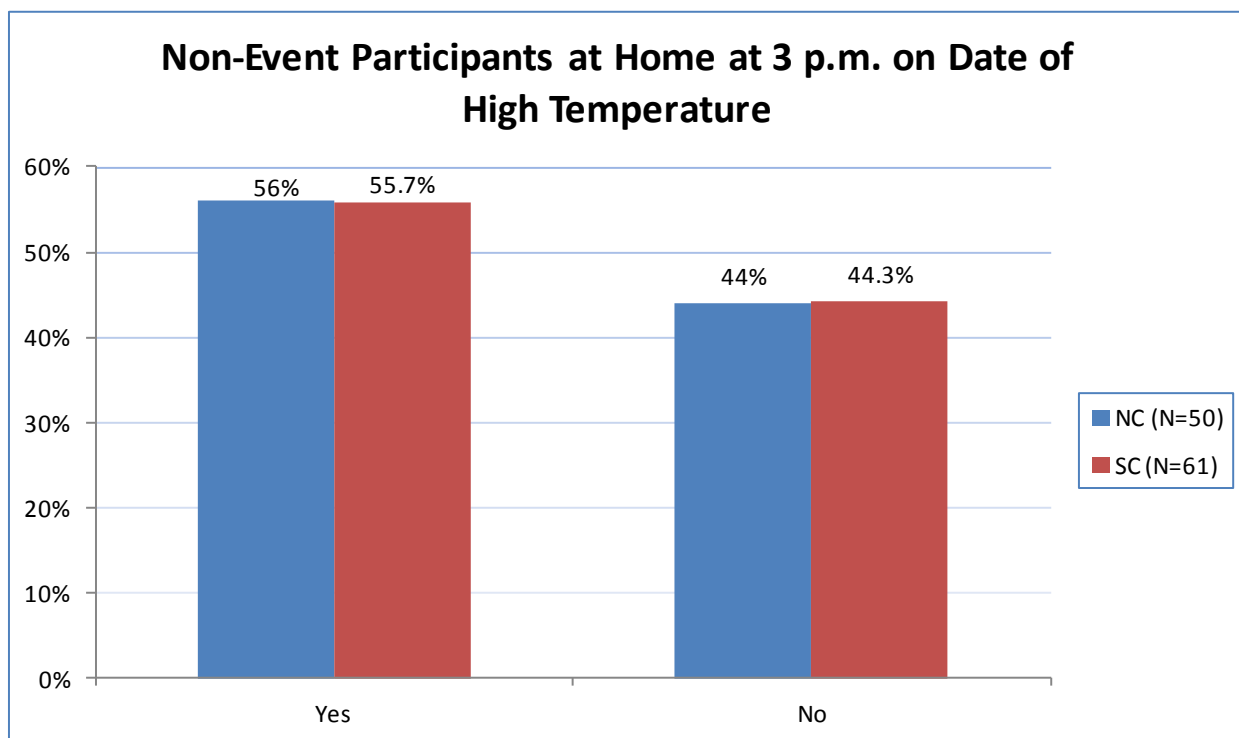


Figure 23. Non-Event participants at home at 3 p.m. on date of high temperature.

Changes in Comfort and Comfort Drivers

The next part of the survey for both Event and Non-Event participants dealt with any perceived change in comfort being ascribed to a Power Manager activation and whether there were other drivers of that comfort change beyond the activation.

TecMarket Works then asked two comfort related questions to the 53 event participants and 32 non-event participants in North Carolina and the 78 event participants and 27 non-event participants in South Carolina that indicated that they or a family member were home during the event or high temperature.

The first question asked for the participant to rate their level of comfort before the activation or time of high temperature on a 1-to-10 scale with one being very uncomfortable and ten being very comfortable. TecMarket Works then asked participants to rate their comfort level during the event or time of high temperature using the same scale. Table 24 below shows that more than of both Event and Non-Event survey respondents in both states indicated no change in their comfort level during the Power Manager activation or time of high temperature.

Table 24. Comfort perception percentages by customers at home during an event

		NC		SC	
		Event (N=53)	Non-Event (N=32)	Event (N=78)	Non-Event (N=27)
Participants at home who noticed any change in comfort	N	24	5	35	4
	%	45.3%	15.6%	44.9%	14.8%

For the participants that did notice a change, Table 25 shows the mean ratings for before and during the event or high temperature as well as the high, low and mean difference for event and non-event participants. In each state the event difference is greater than the non-event difference.

Table 25. Rating differences for Events and Non-Events by customers at home during an event

	NC		SC	
	Event (N=24)	Non-Event (N=4)	Event (N=35)	Non-Event (N=4)
Mean of pre-event comfort rating	9.25	9.25	9.08	9.4
Mean of rating during event or high temperature	5.25	6.75	5.95	8.2
Mean difference of ratings	4	2.5	3.13	1.2
Highest difference	9	4	9	2
Lowest difference	1	2	1	1

Participant Perceptions Relative to Comfort Change

TecMarket Works asked participants who noted a change in comfort during the event or non-event timeline an open-ended question as to what they believe caused the change in comfort. The responses are shown below in Figure 24.

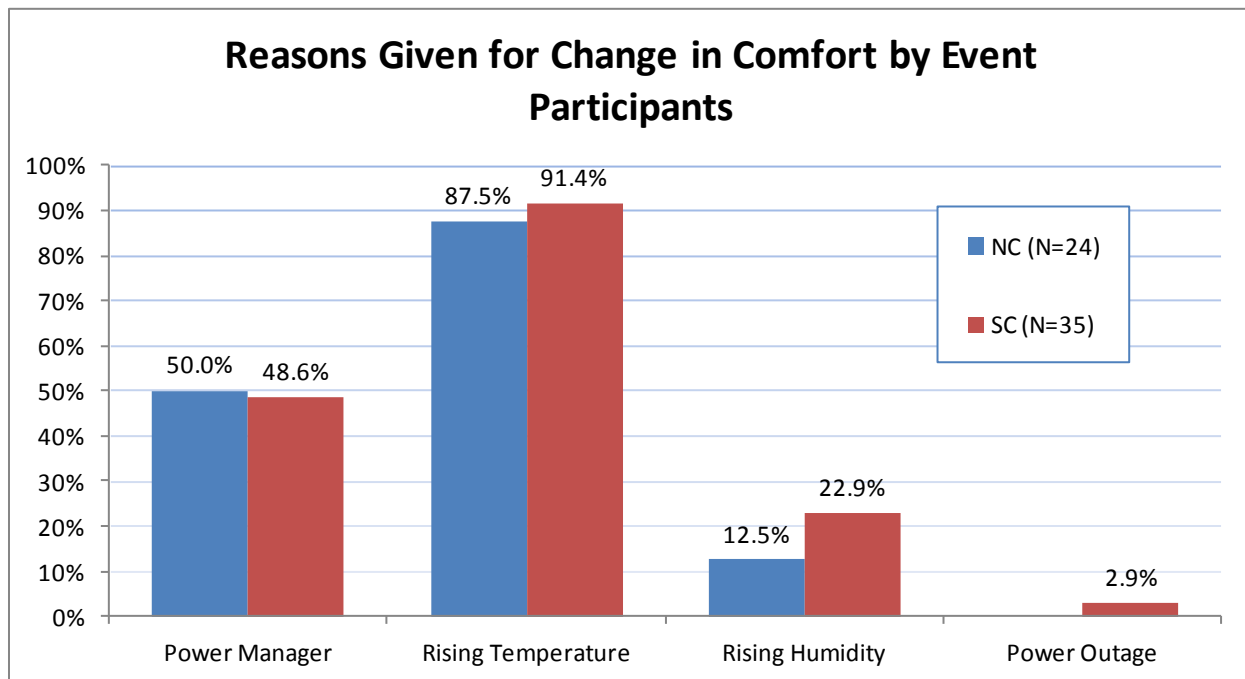


Figure 24. Reasons for comfort change

Figure 24 shows that most event participants attribute their change in comfort to rising temperature. A small percentage (12.5% in North Carolina and 22.5% South Carolina) attribute the change to high humidity.

Also of note is the fact that only about half of the event participants cited Power Manager as contributing to their change in comfort.

Three out of four (75%) non-event participants in North Carolina did cite Power Manager as well as a higher temperature for their change in comfort even though there was no device activation on the day in question. In South Carolina, one out of four (25%) non-event participants cited Power Manager.

This data – along with the data from Figure 19 showing that less than 40% of event participants across both states were aware of an event occurring in the past seven days – suggests there is uncertainty among many participants as to how Power Manager affects their air conditioner and home comfort level. That is, some participants may be unaware that the Power Manager device is causing the changes they feel in comfort, while others may be attributing a change in comfort to participation in Power Manager when that change is in fact being caused by other factors.

Behaviors During Event Activation

TecMarket Works asked several questions regarding behavior associated with a Power Manager device activation.

Thermostat Adjustments

Participants who indicated that they or a family member had been home during the time of the event or high temperature non-event day were asked if they had adjusted their thermostat during that time.

Seven event participants in North Carolina and six event participants in South Carolina indicated that they adjusted their thermostat. In North Carolina the mean thermostat setting was 76°F prior to the adjustment and 73°F following the adjustment. In South Carolina the mean thermostat setting was 76°F prior to the adjustment and 71°F following the adjustment.

No non-event participants in the Carolinas stated that they had adjusted their thermostats.

Use of Fans and Other Ways to Keep Cool

Participants who indicated that they or a family member had been home during the time of the event or high temperature period were then asked if they had turned on any fans during that time period. As can be seen in Table 26, participants' use of fans changed little regardless of state or event status.

Table 26. Did you or your family turn on a fan during event or high temperature?

	NC		SC	
	Event (N=55)	Non-Event (N=28)	Event (N=86)	Non-Event (N=34)
Yes	40%	30%	29.1%	30%
No	60%	70%	67.4%	70%
Don't Know	-	-	3.5%	-

Participants were then asked an open-ended question as to whether they did anything else to keep cool during the timeframe of the Power Manager device activation or high temperature. Twenty-six out of twenty-eight (92.8%) non-event participants in North Carolina, and thirty-one out of thirty-four (90%) of non-event participants in South Carolina stated that they either did nothing else or nothing at all in response to the device activation or high temperature.

Forty out of fifty-five (72.7%) event participants in North Carolina, and sixty-six out of eighty-six (76.7%) event participants in South Carolina reported no further action or no action at all in response to the activation.

The event responses for each state for participants who reported further actions to keep cool are included in Table 27.

Table 27. Actions participants took to cool down

	Times mentioned for...			
	NC(N=55)		SC (N=86)	
Drank more water/cool drinks	9	16.4%	11	12.8%
Moved to a cooler part of the house	3	5.5%	6	7.0%
Left the house and went somewhere cool	5	9.1%	5	5.8%

Wore less clothing	2	3.6%	5	5.8%
Turned on room/window A/C	-	-	2	2.3%
Closed blinds/shades	1	1.8%	2	2.3%
Opened windows	1	1.8%	-	-
Sat still	-	-	1	1.2%

Notably, two event participants in South Carolina indicated that they had used room air conditioners to keep cool or to compensate for the Power Manager device activation and thus cancelling out the program's desired effect.

Age of Air-Conditioner and Change in Comfort Levels During Event

TecMarket Works asked participants for the age of their air conditioner. The distributions are shown below in Figure 25.

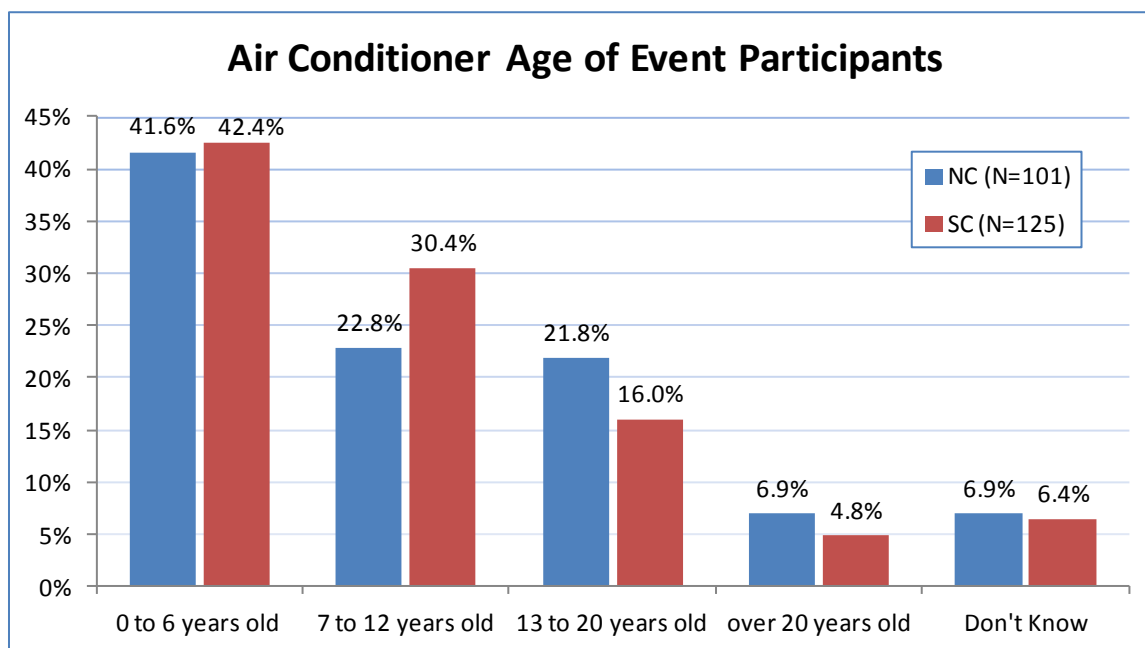


Figure 25. Air Conditioner age of event participants

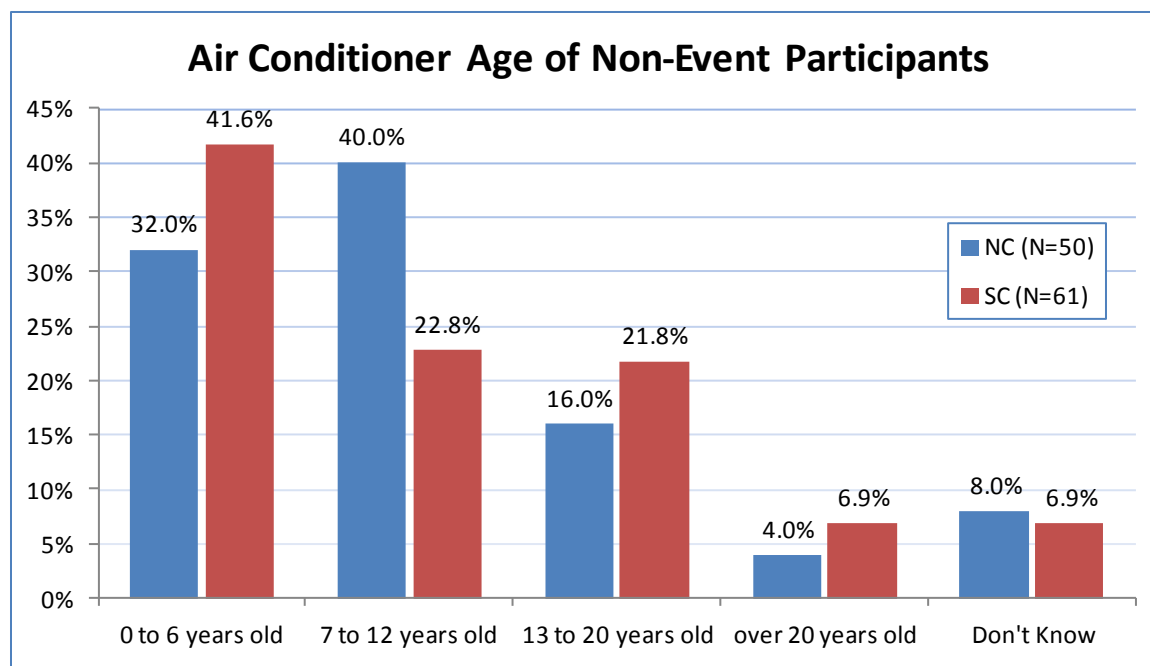


Figure 26. Air Conditioner age of non-event participants

These distributions are similar between North Carolina and South Carolina as well as event and non-event participants with the majority of air conditioners 12 years old or less for all groups. Cross-tabulating air conditioner age with comfort ratings yields the following line chart (Figure 27).

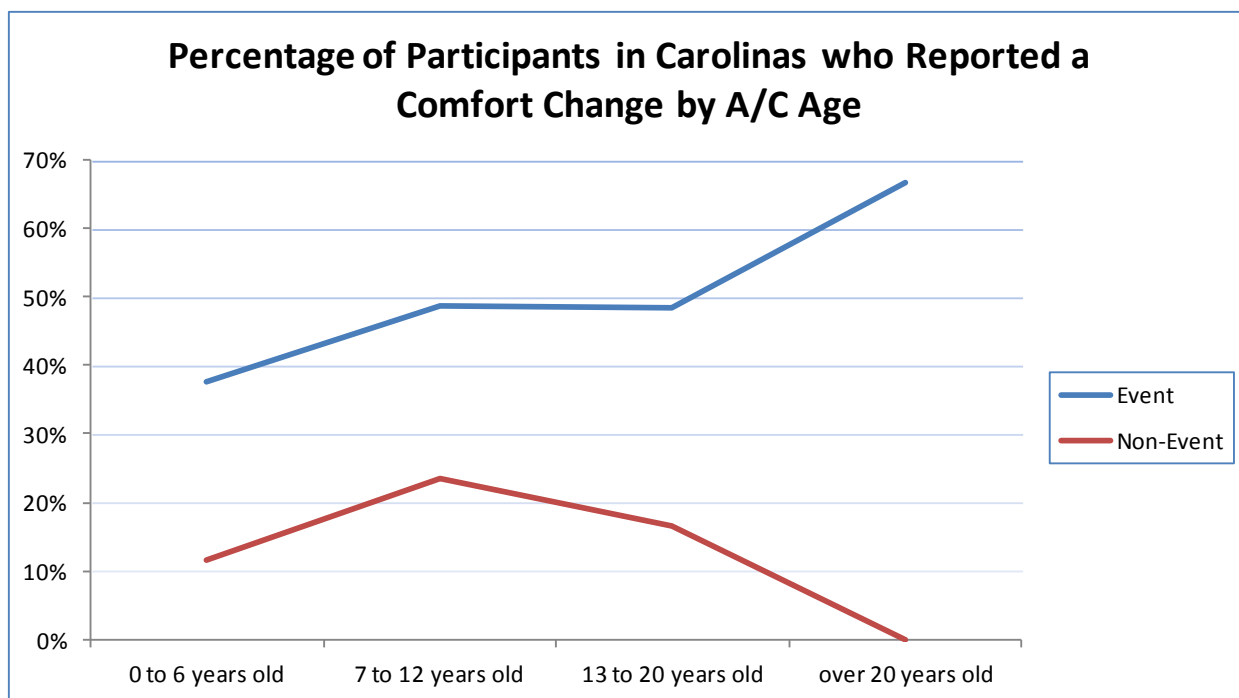


Figure 27. Comfort change vs. Air conditioner age

In Figure 27 the event lines tend to diverge from the non-event lines from left to right on the graph. This suggests that there may be a correlation between the age of a Power Manager participant's air conditioner and the change in comfort perceived during a Power Manager activation event.

Figure 28 and Figure 29 show more detail on this issue. In Figure 28 the ratio between participants who experienced no change and those who experienced change becomes smaller as the graph moves from left to right. In Figure 29 these ratios remain relatively constant regardless of the age of the air conditioner.

This finding suggests that targeting customers with air conditioners less than 12 years old may result in better comfort ratings as well as a higher retention rate for Power Manager participants, but may not result in more effective power shed. Furthermore, cross-selling opportunities may exist for marketing Duke Energy's Residential Smart Saver program for air conditioner savings to Power Manager participants with older air conditioners.

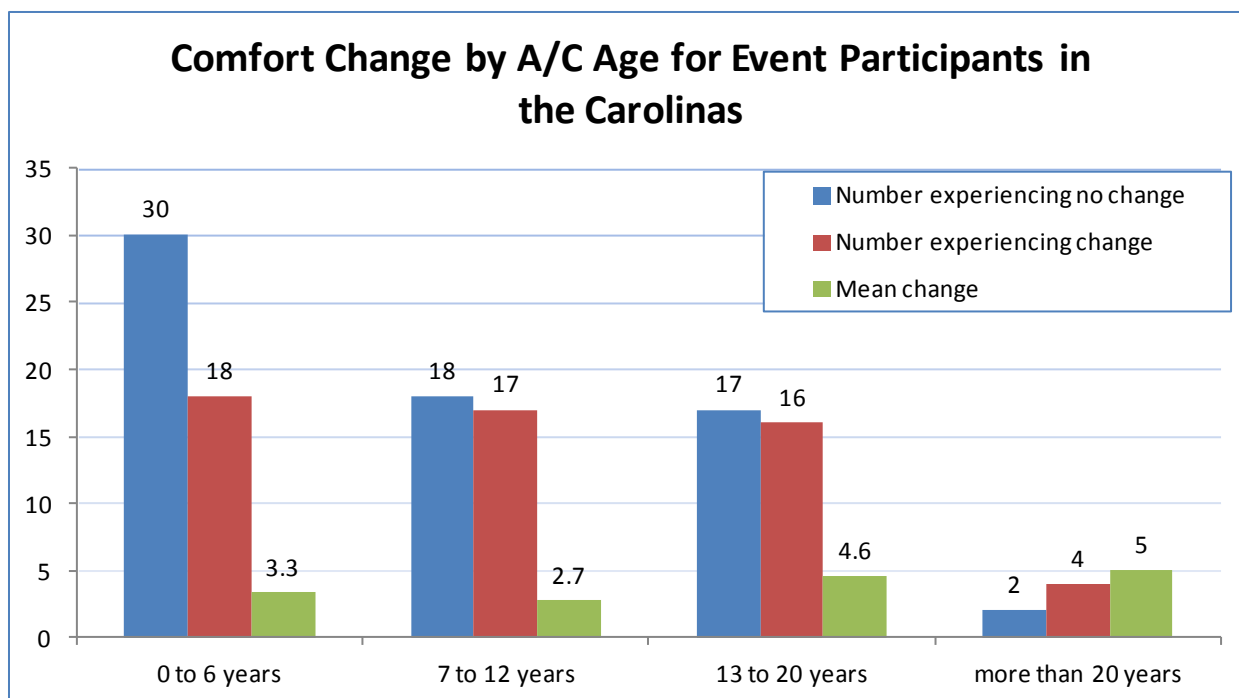


Figure 28. Comfort Change vs. Air conditioner age for event participants

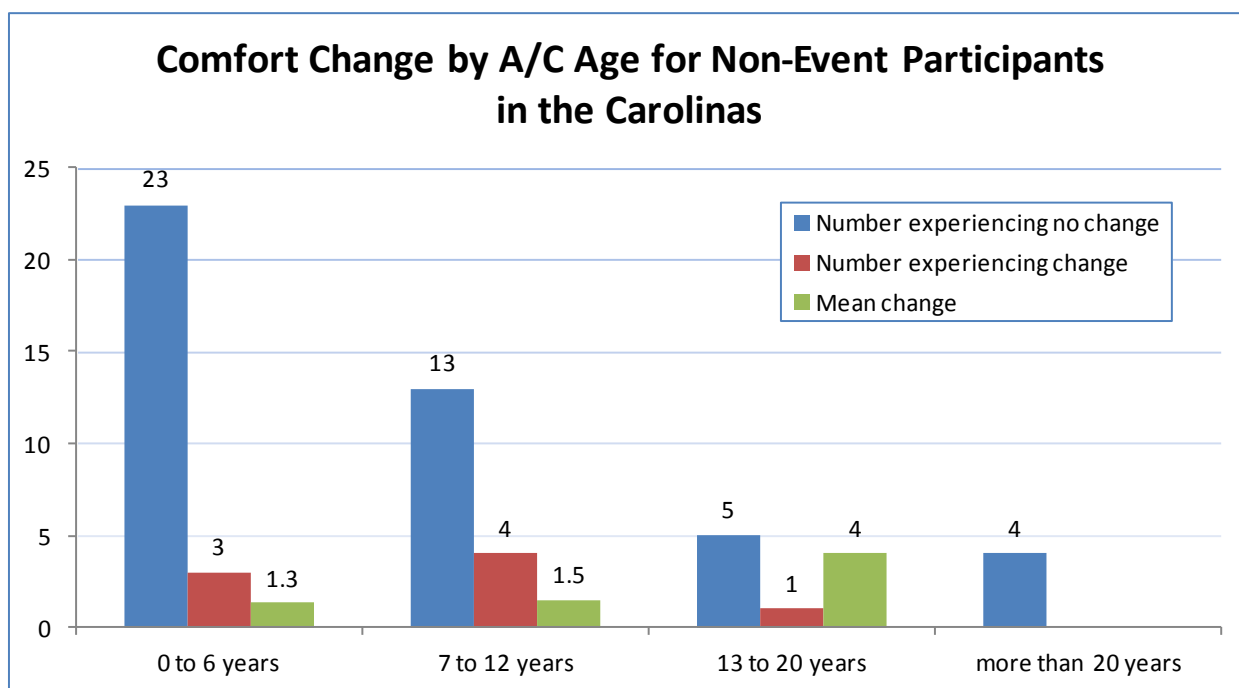


Figure 29. Comfort Change vs. Air conditioner age for non-event participants

Recency Participant Population

Recency survey participants were also asked how many people lived in their home and how many were regularly home on a weekday afternoon. The distributions are shown below in Figure 30, Figure 32, Figure 32 and Figure 33.

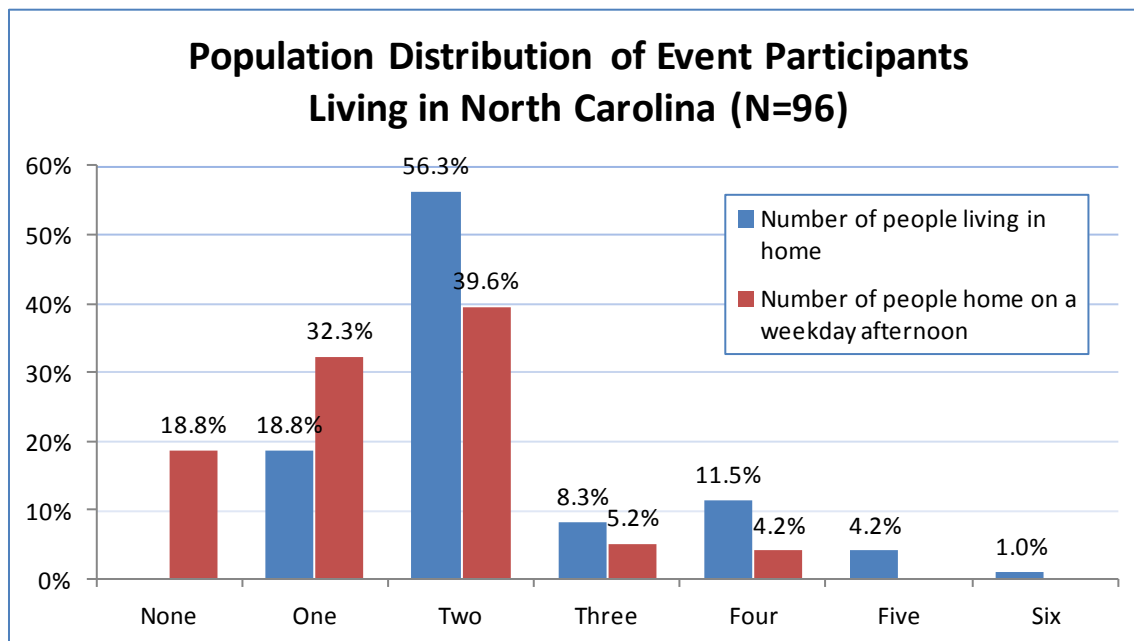


Figure 30. Population distribution of Event participants in North Carolina

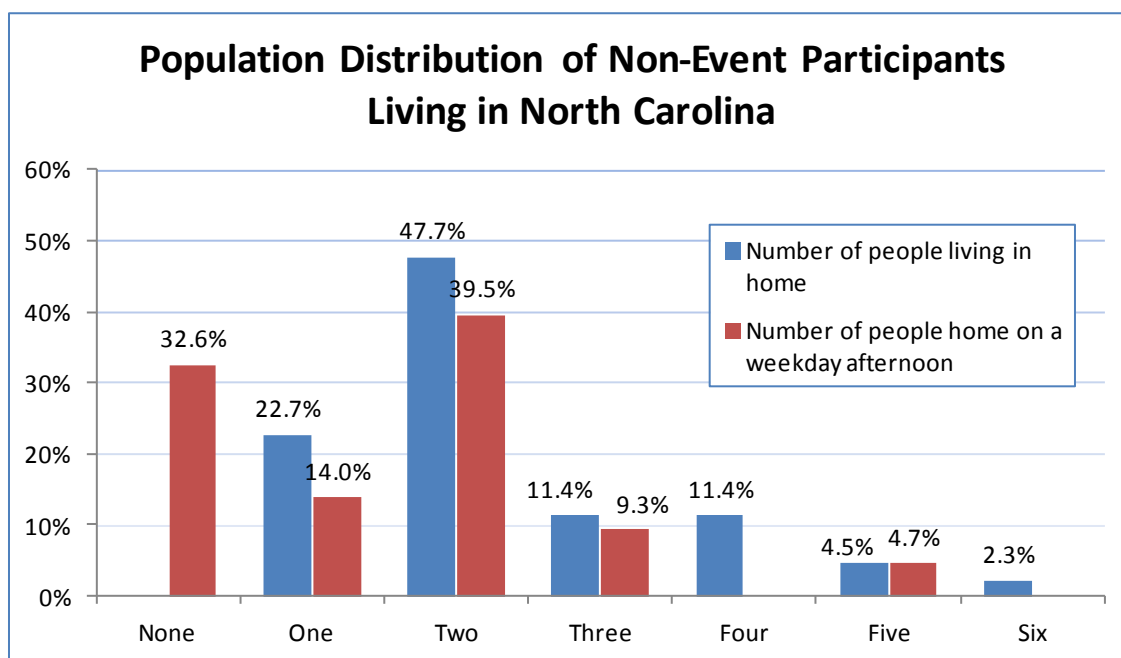


Figure 31. Population distribution of Non-Event participants in North Carolina

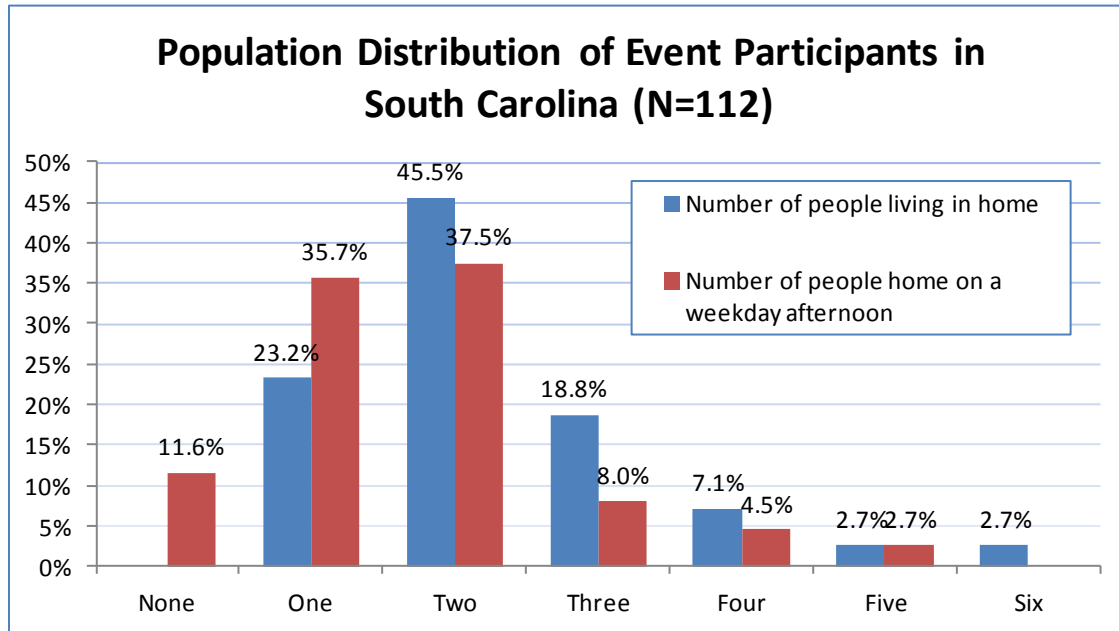


Figure 32. Population distribution of Event participants in South Carolina

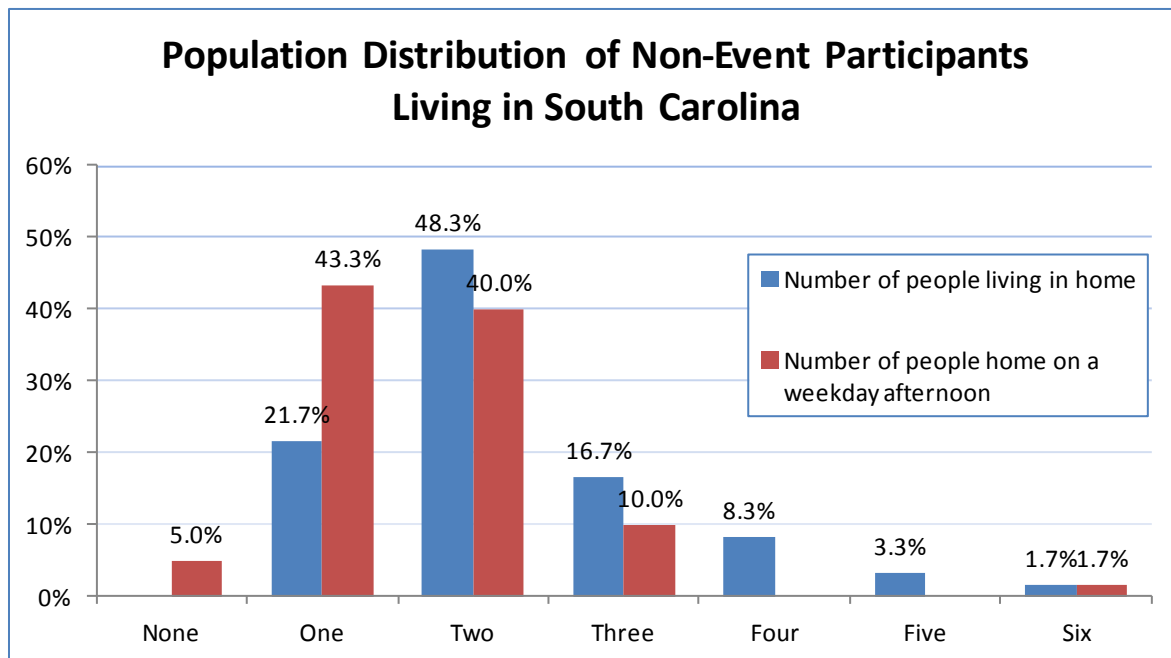


Figure 33. Population distribution of Non-Event participants in South Carolina

Section 4: Comfort Values and Heat Index or Temperature

No Correlation: Temperature or Heat Index and Comfort Levels

There is no statistical relationship between a surveyed participants' awareness of an event occurring and an event actually occurring. That is, if an event occurs and a customer was surveyed, they were no more likely to correctly answer if there was an event or not than someone who did not experience a control event.

In addition, there is no correlation (Pearson Correlation = 0.013 and is not statistically significant) between a surveyed participant's comfort level and the temperature setting on the day in question before the event or the day prior to the high temperature day (for participants surveyed about non-event days), regardless if there was an event or not. This indicates that people are comfortable in their homes with their temperature settings before the event. Further, there is no significant correlation (Pearson Correlation = 0.001 and is not statistically significant) between a surveyed participant's comfort level and the temperature setting during the event or high temperature period.

This suggests that the customers are comfortable in their homes, at the temperature setting they have their thermostats set at. Looking at reported comfort levels during the event or high temperature day again reveals no correlation (0.097 and 0.150, respectively, the latter with statistical significance). Finally, looking at reported change in comfort levels compared to the high temperature and the heat index for the day in question reveals no correlation (-.031 and .230, respectively, with the latter significant at the 0.01 level).

This suggests that the customers are comfortable in their home with their air conditioners on, and do not experience any significant change in comfort regardless if there is a control event or what the high temperature or heat index of the day is.

Appendix A: Program Manager Interview Instrument

Name: _____

Title: _____

Position description and general responsibilities:

We are conducting this interview to obtain your opinions about and experiences with the Power Manager program. We'll talk about the Power Manager Program and its objectives and your thoughts on improving the program. The interview will take about one hour to complete. Your responses during this interview will be kept confidential May we begin?

Program Objectives & Operations

1. Please explain how the Power Manager program works: Walk us through the participatory steps starting with a customer who knows nothing about the program.
 - Outreach and Marketing
 - Enrollment
 - Event Call
 - Response
 - Payment
2. Please describe your role and scope of responsibility in detail. When did you take on this role?
3. Do you feel that you have enough support and resources to adequately manage this program? If not, what else is needed?
4. In your own words, please briefly describe the Power Manager Program's objectives. Any other objectives?
5. Have these objectives changed in the last year or so, and if so how? Why?
6. In your opinion, how well are objectives being met?
7. Are there any new external influences on the program since the objectives were developed, that might be affecting program operations? If yes, is there anything the program can do to

address those influences? Or, do you think the objectives should be adjusted to reflect the new influences?

8. Do you think the materials and information presented to the residential customer about the Power Manager program provides a complete enough picture for them to understand the potential importance of the program to them and their participatory benefits of the program?
9. Do you think the incentives offered through the Power Manager program are adequate enough to entice the residential customer to enroll in the program? Why or why not? What can be improved in the area of incentives or enticements?
10. Are there any changes to the incentives or marketing that could possibly increase participation in the program? What would happen if the incentives were decreased or increased, how would this impact your ability to acquire power reductions?
11. What kinds of marketing, outreach and customer contact approaches do you use to make your customers aware of the program? Are there any changes to the program marketing that you think would increase participation?

Program Design & Implementation

12. How does Duke determine the best target markets or customer segments to focus on?
13. Are there any market information, research or market assessments that you are using to identify market barriers, and to develop more effective operational mechanisms?
14. How do you track, manage, and monitor or evaluate customer involvement?
15. What is the quality control, tracking and accounting process for determining how well control strategies work?
16. (for post-season interview) Please tell me about the events that were called in 2011. How many events were called? Why were they called?
17. (for post-season interview) How were the events called? What did you learn from the event call process? Where there any surprises with the process? What could be done to improve the way the events are called in the future?
18. (for post-season interview) Did you achieve the load shift you needed? How do you know this?
19. (for post-season interview) How well did the payment process operate? Did the program staff come across any issues or problems with payment? How were they resolved?

Overall Power Manager Management

20. (summer interview) During the last process evaluation of Power Manager, Duke Energy was in the process of addressing some problems in communication with the switches and failure rates. Can you describe this so that we understand it well? Are you experiencing the same problems in 2011? What is being done to deal with this issue? Do you have any suggestions for improving this in addition to the approaches being taken?
21. (summer interview) The last process evaluation of Power Manager, included a number of recommendations for Duke Energy to consider. I'd like to go over these and find out if Duke has adopted those recommendations or, if not, why Duke decided against them.
- Add staff to help with the administrative needs during control season. It is critical to ensure that program operations run efficiently in the eyes of the participants during those times, and that all customer concerns during events are addressed promptly.
 - In program planning, estimate the number of economic events separately from emergency events should be considered.
 - Consider leapfrogging the Cannon switch technology in favor of a switch that allows two-way communication, or one that can be integrated with a smart grid
- (for the analytical team members:)*
- A potential alternative approach for future impact evaluations is to use the data from the M&V (and possibly the operability) sample to directly estimate impacts via statistical models. This approach could use a time-series, cross-sectional analysis where the dependent variable is the actual AC load (or run time), and the independent variables include weather conditions, time of day, day of week, and the Power Manager control event. In essence, this would produce an overall duty-cycle model, and the coefficient on the Power Manager control event variable(s) would estimate the actual load impacts during those events. This assumption is based on the panel sample being representative of the program population.
22. Describe the use of any internal or outside program advisors, technical groups or organizations that have in the past or are currently helping you think through the program's approach or methods. How often do you use these resources? What do you use them for?
23. In what ways do you think the Power Manager Program's operations could be improved?
24. Do you have any suggestions for how program participation can be increased?
25. If you could change any part of the program what would you change first?
26. What would you say are the program's biggest successes?
27. We've covered a lot of areas today, but are there any other issues or topics you think we should know about and discuss for this evaluation?
28. Do you have any questions for me, about this interview or this process evaluation?

Thank you for your time...

Appendix B: Participant Survey Instrument

Use five attempts at different times of the day and different days before dropping from contact list. Call times are from 10:00 a.m. to 8:00 p.m. EST or 9-7 CST Monday through Saturday. No calls on Sunday.

SURVEY

Introduction

Note: Only read words in bold type.

Introduction

Hello, my name is _____, and I'm calling on behalf of Duke Energy. According to our information, you presently participate in Duke Energy's Power Manager Program. This program allows Duke Energy to cycle your air conditioner when there is a critical need for electricity in the region. This survey will take about 15 minutes to complete, and the information you provide will be confidential and will help to improve the program.

1. Are you aware of your participation in the Power Manager program?

☐ Yes ☐ No ☐ DK

If no, May I please speak to the person who would be most familiar with your household's participation in the Power Manager program?

If not available, try to schedule a callback time. If transferred, begin survey from beginning (Introduction).

Participation Drivers

We would like to collect some information on why you agreed to participate in the program and how you heard about it.

2. Were you involved in the decision to participate in Duke Energy's Power Manager Program?

☐ Yes ☐ No ☐ DK

If no, skip to question 5.

3. Do you recall how you first heard about the program?

☐ Yes ☐ No ☐ DK

If yes, 3a. **How did you hear about the Power Manager Program?**

- a) ☐ utility bill insert
- b) ☐ direct mail offer from Duke Energy
- c) ☐ utility website
- d) ☐ Word-of-mouth (friend/neighbor/landlord)
- e) ☐ Newspapers
- f) ☐ Social network: _____
- g) ☐ Don't know
- h) ☐ Other: _____

4. **To the best of your ability, could you please tell me what the promoted benefits of the program were?**

- a) ☐ _____
- b) ☐ Don't Know.

5. **What was the main reason why you chose to participate in the program?**

- a) ☐ For the bill credits
- b) ☐ Helping Duke avoid power shortages/outages
- c) ☐ To save energy
- d) ☐ To save money (through lower utility bills)
- e) ☐ To help the environment
 - a. Please explain: (to reduce carbon or GHG, etc...) _____
- f) ☐ I don't use the air conditioner much
- g) ☐ I'm usually not home when the events are supposed to occur
- h) ☐ Don't know
- i) ☐ Other: _____

5a. **Do you recall reading this benefit in the program brochure or materials sent to you?**

- ☐ Yes ☐ No ☐ DK
☐ Did not get brochure ☐ Do not remember brochure

6. **What were your other reasons for choosing to participate in this program?**

- a) ☐ For the bill credits
- b) ☐ Helping Duke avoid power shortages/outages
- c) ☐ To save energy (through lower utility bills)
- d) ☐ To save money
- e) ☐ To help the environment
 - a. Please explain: (to reduce carbon or GHG, etc...) _____
- f) ☐ I don't use the air conditioner much

- g) ☐ I'm usually not home when the events are supposed to occur
- h) ☐ Don't know
- i) ☐ Other: _____
- j) ☐ No other reasons.

6a. Do you recall reading anything about this benefit in the program brochure or materials sent to you?

- ☐ Yes ☐ No ☐ DK
☐ Did not get brochure ☐ Do not remember brochure

7. Generally speaking, how important are environmental issues to you? Would you say they are...

- a. ☐ Very Important
- b. ☐ Important
- c. ☐ Neither Important Nor Not Important
- d. ☐ Not Important, or
- e. ☐ Not At All Important

8. How important are climate change issues to you? Would you say they are...

- a. ☐ Very Important
- b. ☐ Important
- c. ☐ Neither Important Nor Not Important
- d. ☐ Not Important, or
- e. ☐ Not At All Important

9. How important is reducing air pollution to you? Would you say it is...

- a. ☐ Very Important
- b. ☐ Important
- c. ☐ Neither Important Nor Not Important
- d. ☐ Not Important, or
- e. ☐ Not At All Important

10. How important is the need to reduce the rate of building new power plants? Would you say it is...

- a. Very Important
- b. Important
- c. Neither Important Nor Not Important
- d. Not Important
- e. Not At All Important

11. Are you a member of any groups or clubs that have environmental missions?

☐ Yes ☐ No ☐ DK

If yes, 11a. **Which ones?**

- a) ☐ List: _____
b) ☐ Don't know

Understanding the Program

12. Before you enrolled in the program, you received program information from Duke Energy that described how the program works. Using a scale of 1 to 10 where 1 indicates "Very Dissatisfied" and 10 indicates "Very Satisfied", how satisfied were you with this information in helping you to understand how the program works?

1 2 3 4 5 6 7 8 9 10

If 8 or below, 12b. **Why were you less than satisfied with this information?**

☐ DK

13. How often per year did Duke Energy say it would activate the Power Manager device on your air conditioner?

☐ DK

14. What's your best estimate of how many dollars you will receive in yearly bill credits from Duke Energy for participating in the Power Manager program?

- a) ☐ \$____
b) ☐ Don't know

15. According to our information are currently a participant in this program. Have you receive any bill credits this year from Duke Energy for participating in this program?

☐ Yes ☐ No ☐ DK

16. Is anything unclear to you about how the program works?

☐ Yes ☐ No ☐ DK

If yes, 16a. **What is unclear to you?**

☐ DK

17. Did you ever call or email Duke Energy to find out more about the Power Manager Program?

☐ Yes ☐ No ☐ DK

If no, skip to question 18.

If yes, 17a. Using a scale of 1 to 10 where 1 indicates "Very Dissatisfied" and 10 indicates "Very Satisfied", how satisfied were you with the ease of reaching a Duke Energy representative?

1 2 3 4 5 6 7 8 9 10

If 8 or below, 17b. Why were you less than satisfied?

17c. Using a scale of 1 to 10 where 1 indicates "Very Dissatisfied" and 10 indicates "Very Satisfied", how satisfied were you with how the person responded to your questions?

1 2 3 4 5 6 7 8 9 10

If 8 or below, 17d. Why were you less than satisfied with this information?

- a) ☐ Didn't respond to my questions/ concerns
- b) ☐ Unable to answer/address my questions/concerns
- c) ☐ Not professional/courteous
- d) ☐ Other: _____
- e) ☐ Don't know

Program Experience

18. Has Duke Energy activated the Power Manager device since you joined the program?

[If they ask what this means, respond with: "Duke Energy has the ability to send a signal to activate the device to cycle your central air conditioner on and off during an event." Repeat the question.]

☐ Yes ☐ No ☐ DK

19. How do you know when the device has been activated?

- a) ☐ A/C shuts down

- b) ☐ Home temperature rises
- c) ☐ The light on the meter is on
- d) ☐ Light on AC unit flashes
- e) ☐ Bill credits
- f) ☐ Lower bill
- g) ☐ Other: _____
- h) ☐ Don't know

20. About how many times did Duke Energy activate your Power Manager device so far in 2011?

- a) ☐ _____
- b) ☐ Don't know

21. Were you or any members of your household home when Duke Energy activated your Power Manager device this past summer?

- ☐ Yes ☐ No ☐ DK

If no or don't know, skip to question 28.

22. During this activation, using a scale of 1 to 10 where 1 means very uncomfortable and 10 means very comfortable, how would you describe your level of comfort before the control event?

1 2 3 4 5 6 7 8 9 10

- a) ☐ DK

23. Using the same scale of 1 to 10 where 1 means very uncomfortable and 10 means very comfortable, how would you describe your level of comfort during the control event?

1 2 3 4 5 6 7 8 9 10

- a) ☐ DK

If score from Q23 is lower than score from Q22:

24. What do you feel caused your decrease in comfort?

Select all that apply:

- a) ☐ Power Manager
- b) ☐ Rising Temperature
- c) ☐ Rising Humidity
- d) ☐ Power Outage

- e) ☐ Other: _____
f) ☐ Don't Know

25. When Duke Energy activated your Power Manager device, did you or any other members of your household adjust the settings on your thermostat?

☐ Yes ☐ No ☐ DK

If yes, 25a. What temperature was it originally at, and what temperature did you set it to during the control event?

Original temperature setting: _____ degrees F
☐ DK

Adjusted temperature setting: _____ degrees F
☐ DK

26. Thinking about this summer, how many times do you think the activation of the Power Manager program affected your level of comfort?

- a) ☐ _____
b) ☐ Don't know

27. When Duke Energy activated your Power Manager device, did you or any other members of your household turn on any fans to keep cool?

☐ Yes ☐ No ☐ DK

27a. What else did you or other members of your household do to keep cool?

- a) ☐ Continued normal activities/ Didn't do anything different
b) ☐ Turned on room/window air conditioners
c) ☐ Closed blinds/shades
d) ☐ Moved to a cooler part of the house
e) ☐ Left the house and went somewhere cool
f) ☐ Wore less clothing
g) ☐ Drank more water/cool drinks
h) ☐ Turned on fans
i) ☐ Opened windows
j) ☐ Other: _____
k) ☐ Don't know

28. When Duke Energy activates your Power Manager device, it usually does so on summertime afternoons. Is someone usually home on weekday afternoons during the summertime?

☐ Yes ☐ No ☐ DK

29. Why do you think Duke Energy activates your Power Manager device on summertime weekdays during the afternoon as opposed to other times of the day or year?

- a) ☐ _____
b) ☐ Don't know

Overall Program Satisfaction

30. Using a scale of 1 to 10 where 1 indicates "Very Dissatisfied" and 10 indicates "Very Satisfied", how satisfied were you with the process of enrolling in the program?

1 2 3 4 5 6 7 8 9 10

If 8 or below, 30b. Why were you dissatisfied with this enrollment process?

- a) ☐ _____
b) ☐ Don't Know

31. Using a scale of 1 to 10 where 1 indicates "Very Dissatisfied" and 10 indicates "Very Satisfied", how satisfied are you with the Power Manager program in general?

1 2 3 4 5 6 7 8 9 10

If 8 or below, 31b. Why were you less than satisfied with Power Manager?

- a) ☐ They activated my Power Manager device more often than I would like
b) ☐ The bill credits/incentives were not large enough
c) ☐ I was uncomfortable when my Power Manager device was activated
d) ☐ Other: _____
e) ☐ Don't Know

31c. Were there any other reasons you were less than satisfied with Power Manager?

- a) ☐ They activated my Power Manager device more often than I would like
b) ☐ The bill credits/incentives were not large enough
c) ☐ I was uncomfortable when my Power Manager device was activated
d) ☐ Other: _____
e) ☐ Don't Know
f) ☐ No

32. Would you recommend this program to a friend, neighbor, or co-worker?

☐ Yes ☐ No ☐ DK

If no, 32b. Why not?

- a) ☐ _____
- b) ☐ Don't Know

33. What, if any, Duke Energy programs or services have you heard of that help customers save energy? Any others?

- a) ☐ Smart Saver (other than CFL)
- b) ☐ Personalized Energy Report
- c) ☐ Home Energy House Call
- d) ☐ Home Energy Comparison Report
- e) ☐ CFL Program
- f) ☐ Energy Star Homes
- g) ☐ Low Income, Weatherization, or Low Income Weatherization
- h) ☐ K12, NEED, or "Get Energy Smart"
- i) ☐ Other: _____
- j) ☐ Don't Know

Air Conditioning Practices

Now I'm going to ask you some questions about your air conditioning use.

34. How often do you use your central air conditioner? Would you say you use it ...

- a) ☐ Not at all
- b) ☐ Only on the hottest days
- c) ☐ Frequently during the cooling season
- d) ☐ Most days during the cooling season
- e) ☐ Everyday during the cooling season
- f) ☐ Don't know

If b-e, 34a. About how many days would you estimate that you had your air conditioner on so far this summer?

- a) ☐ Fewer than 10 days
- b) ☐ 10 to 20 days
- c) ☐ 21 to 30 days
- d) ☐ 31 to 40 days
- e) ☐ 41 to 50 days
- f) ☐ 51 to 60 days

- g) ☐ 61 to 70 days
- h) ☐ more than 71 days
- i) ☐ every day
- j) ☐ Don't know

35. Have you had your air conditioner tuned-up or serviced since you enrolled in the Power Manager program?

☐ Yes ☐ No ☐ DK

If yes, 35a. Did the performance of your air conditioner improve after you had it serviced?

☐ Yes ☐ No ☐ DK

35b. Who serviced your air conditioner?

- a) ☐ Air conditioning contractor
- b) ☐ Duke Energy
- c) ☐ Electrician
- d) ☐ Other: _____
- e) ☐ Don't Know

36. Is the air conditioner typically used to keep someone at home comfortable during weekday summer afternoons before 5 P.M.?

☐ Yes ☐ No ☐ DK

37. Is the air conditioner typically used to keep someone at home comfortable during summer weekdays after 5 P.M.?

☐ Yes ☐ No ☐ DK

38. When you think of a typical hot and humid summer day, at what outside temperature do you tend to feel uncomfortably warm?

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ 79-81 degrees
- g) ☐ 82-84 degrees
- h) ☐ 85-87 degrees
- i) ☐ 88-90 degrees
- j) ☐ 91-94 degrees
- k) ☐ 95-97 degrees

- l) ☐ 98-100 degrees
- m) ☐ > 100 degrees
- n) ☐ Don't Know

39. At what outside temperature do you tend to turn on the air conditioner?

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ 79-81 degrees
- g) ☐ 82-84 degrees
- h) ☐ 85-87 degrees
- i) ☐ 88-90 degrees
- j) ☐ 91-94 degrees
- k) ☐ 95-97 degrees
- l) ☐ 98-100 degrees
- m) ☐ > 100 degrees
- n) ☐ It's programmed into the thermostat.
- o) ☐ Don't Know

If n, 39a. Do you set your thermostat seasonally or when the weather gets hot?

- i. ☐ I program the thermostat seasonally
- ii. ☐ When the weather gets hot
- iii. ☐ Other: _____

40. I am going to read a list of time periods. For each time period, please tell me the temperature that your thermostat is typically set to on a hot summer weekday when you are using the air conditioner, or if it is turned off.

40a. On a hot weekday morning from 6 am to noon.

- p) ☐ < 65 degrees
- q) ☐ 65-68 degrees
- r) ☐ 69-72 degrees
- s) ☐ 73-75 degrees
- t) ☐ 76-78 degrees
- u) ☐ >78 degrees
- v) ☐ No change from an average summer week day
- w) ☐ OFF

40b. On a hot weekday afternoon from noon to 5 pm

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ >78 degrees
- g) ☐ No change from an average summer week day
- h) ☐ OFF

40c. On a hot weekday evening from 5 pm to 10pm.

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ >78 degrees
- g) ☐ No change from an average summer week day
- h) ☐ OFF

40d. During a hot weekday night from 10pm to 6am.

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ >78 degrees
- g) ☐ No change from an average summer week day
- h) ☐ OFF

41. I would now like to know the thermostat temperature setting for those same time periods but on a hot summer weekend.

41a. On a hot weekend morning from 6 am to noon.

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ >78 degrees
- g) ☐ No change from an average summer weekend day
- h) ☐ OFF

41b. On a hot weekend afternoon from noon to 5 pm

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ >78 degrees
- g) ☐ No change from an average summer weekend day
- h) ☐ OFF

41c. On a hot weekend evening from 5 pm to 10pm.

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ >78 degrees
- g) ☐ No change from an average summer weekend day
- h) ☐ OFF

41d. During a hot weekend night from 10pm to 6am.

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ >78 degrees
- g) ☐ No change from an average summer weekend day
- h) ☐ OFF

42. How old is your air conditioner?

- a) ☐ 0 to 6 years old
- b) ☐ 7 to 12 years old
- c) ☐ 13 to 20 years old
- d) ☐ over 20 years old
- e) ☐ Don't Know

43. Duke Energy is always looking for other ways to help their customers. If Duke were to offer a program that cycles other equipment at your home such as an electric water heater, would you be interested in participating??

☐ Yes ☐ No ☐ DK

44. Are there any programs or services that you think Duke Energy should provide to its residential customers that are currently not provided?

☐ Yes ☐ No ☐ DK

If yes, 44b. What services or types of programs?

45. Using a scale of 1 to 10 where 1 indicates “Very Dissatisfied” and 10 indicates “Very Satisfied”, What is your overall satisfaction with Duke Energy?

1 2 3 4 5 6 7 8 9 10

a) ☐ Don't Know

If 8 or below, 45b. Why were you less than satisfied with Duke Energy?

46. Did you experience any power outage issues on any of the days that Duke Energy activated your Power Manager device?

☐ Yes ☐ No ☐ DK

Demographics

Finally, we have two short demographic questions.

47. How many people live in this home?

- a) ☐ 1
- b) ☐ 2
- c) ☐ 3
- d) ☐ 4
- e) ☐ 5
- f) ☐ 6

- g) ☐ 7
- h) ☐ 8 or more

48. How many persons are usually home on a weekday afternoon?

- a) ☐ 1
- b) ☐ 2
- c) ☐ 3
- d) ☐ 4
- e) ☐ 5
- f) ☐ 6
- g) ☐ 7
- h) ☐ 8 or more

Thank you for your time and feedback today! *Politely end call.*

Appendix C: Participant Recency Survey

Use three attempts at different times of the day within 51 hours of event notification before dropping contact from the contact list. Call times are from 10:00 a.m. to 8:00 p.m. EST or 9-7 CST Monday through Saturday. No calls on Sunday. For example, if a control event occurs on a Monday, calling hours for that particular event would be:

- Monday 5pm-8pm Eastern (4-7 Central)
- Tuesday 10am-8pm Eastern (9-7 Central)
- Wednesday 10am-8pm Eastern (9-7 Central)

SURVEY

Note: Only read words in bold type.

Introduction

Hello, my name is _____, and I'm calling on behalf of Duke Energy. According to our information, you presently participate in Duke Energy's Power Manager Program. This program allows Duke Energy to cycle your air conditioner when there is a critical need for electricity in the region. This is a short survey that will take about 5 minutes to complete, and the information you provide will be confidential and will help to improve the program.

1. Are you aware of your participation in the Power Manager program?

☐ Yes ☐ No ☐ DK

If no, May I please speak to the person who would be most familiar with your household's participation in the Power Manager program?

If not available, try to schedule a callback time within the 51 hour time-frame for the particular event. If transferred, begin survey from beginning (Introduction).

2. Has Duke Energy activated the Power Manager device since you joined the program? [If they ask what this means, respond with: "Duke Energy has the ability to send a signal to activate the device to cycle your central air conditioner on and off during an event." Repeat the question.]

☐ Yes ☐ No ☐ DK

3. How do you know when the device has been activated?

- a) ☐ A/C shuts down
- b) ☐ Home temperature rises
- c) ☐ The light on the meter is on
- d) ☐ Light on AC unit flashes
- e) ☐ Bill credits
- f) ☐ Lower bill
- g) ☐ Other: _____
- h) ☐ Don't know

4. Has your device been activated within the last 7 days?

☐ Yes ☐ No ☐ DK

Your Power Manager device was recently activated on <date> starting at <start time> and ending at <end time>.

5. At what temperature was your thermostat set to during the time of the event?

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ 79-81 degrees
- g) ☐ 82-84 degrees
- h) ☐ 85-87 degrees
- i) ☐ 88-90 degrees
- j) ☐ 91-94 degrees
- k) ☐ 95-97 degrees
- l) ☐ 98-100 degrees
- m) ☐ > 100 degrees
- n) ☐ It's programmed into the thermostat.
- o) ☐ Thermostat was turned off
- p) ☐ Air conditioner was turned off
- q) ☐ DK

6. Were you or any members of your household home when Duke Energy activated your Power Manager device at that time?

☐ Yes ☐ No ☐ DK

If no or don't know, skip to question 13.

7. During this recent activation, using a scale of 1 to 10 where 1 means very uncomfortable and 10 means very comfortable, how would you describe your level of comfort before the control event?

1 2 3 4 5 6 7 8 9 10

a) ☐ DK

8. Using the same scale of 1 to 10 where 1 means very uncomfortable and 10 means very comfortable, how would you describe your level of comfort during the control event?

1 2 3 4 5 6 7 8 9 10

a) ☐ DK

If score from Q8 is lower than score from Q7:

9. What do you feel caused your decrease in comfort?

Select all that apply:

- a) ☐ Power Manager
- b) ☐ Rising Temperature
- c) ☐ Rising Humidity
- d) ☐ Power Outage
- e) ☐ Other: _____
- f) ☐ Don't Know

10. When Duke Energy activated your Power Manager device <today, yesterday, or two days ago>, did you or any other members of your household adjust the settings on your thermostat?

☐ Yes ☐ No ☐ DK

If yes, 10a. What temperature was it originally at, and what temperature did you set it to during the control event?

Original temperature setting: _____ degrees F

☐ DK

Adjusted temperature setting: _____ degrees F

☐ DK

11. When Duke Energy activated your Power Manager device, did you or any other members of your household turn on any fans to keep cool?

☐ Yes ☐ No ☐ DK

12. What else did you or other members of your household do to keep cool?

- a) ☐ Continued normal activities/ Didn't do anything different
- b) ☐ Turned on room/window air conditioners
- c) ☐ Closed blinds/shades
- d) ☐ Moved to a cooler part of the house
- e) ☐ Left the house and went somewhere cool
- f) ☐ Wore less clothing
- g) ☐ Drank more water/cool drinks
- h) ☐ Turned on fans
- i) ☐ Opened windows
- j) ☐ Other: _____
- k) ☐ Don't know

Now I'm going to ask you some questions about your air conditioning use.

13. How often do you use your central air conditioner? Would you say you use it ...

- a) ☐ Not at all
- b) ☐ Only on the hottest days
- c) ☐ Frequently during the cooling season
- d) ☐ Most days during the cooling season
- e) ☐ Everyday during the cooling season
- f) ☐ Don't know

14. When you think of a typical hot and humid summer day, at what outside temperature do you tend to feel uncomfortably warm?

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ 79-81 degrees
- g) ☐ 82-84 degrees
- h) ☐ 85-87 degrees
- i) ☐ 88-90 degrees
- j) ☐ 91-94 degrees
- k) ☐ 95-97 degrees

- l) ☐ 98-100 degrees
- m) ☐ > 100 degrees
- n) ☐ Don't know

15. At what outside temperature do you tend to turn on the air conditioner?

- a) ☐ < 65 degrees
- b) ☐ 65-68 degrees
- c) ☐ 69-72 degrees
- d) ☐ 73-75 degrees
- e) ☐ 76-78 degrees
- f) ☐ 79-81 degrees
- g) ☐ 82-84 degrees
- h) ☐ 85-87 degrees
- i) ☐ 88-90 degrees
- j) ☐ 91-94 degrees
- k) ☐ 95-97 degrees
- l) ☐ 98-100 degrees
- m) ☐ > 100 degrees
- n) ☐ It's programmed into the thermostat.
- o) ☐ Don't know

16. How old is your air conditioner?

- a) ☐ 0 to 6 years old
- b) ☐ 7 to 12 years old
- c) ☐ 13 to 20 years old
- d) ☐ over 20 years old
- e) ☐ Don't Know

17. Using a scale of 1 to 10 where 1 indicates "Very Dissatisfied" and 10 indicates "Very Satisfied", What is your overall satisfaction with the Power Manager program?

1 2 3 4 5 6 7 8 9 10

If 8 or below, 17b. Why are you less than satisfied with Power Manager?

- a) ☐ They activated my Power Manager device more often than I would like
- b) ☐ The bill credits/incentives were not large enough
- c) ☐ I was uncomfortable when my Power Manager device was activated
- d) ☐ Other: _____
- e) ☐ Don't Know

18. Using a scale of 1 to 10 where 1 indicates “Very Dissatisfied” and 10 indicates “Very Satisfied”, What is your overall satisfaction with Duke Energy?

1 2 3 4 5 6 7 8 9 10

If 8 or below, 18b. Why are you less than satisfied with Duke Energy?

19. Did you experience any power outage issues on the day of the event?

☐ Yes ☐ No ☐ DK

Finally, we have two short demographic questions.

20. How many people live in this home?

- a) ☐ 1
- b) ☐ 2
- c) ☐ 3
- d) ☐ 4
- e) ☐ 5
- f) ☐ 6
- g) ☐ 7
- h) ☐ 8 or more

21. How many persons are usually home on a weekday afternoon?

- a) ☐ 0
- b) ☐ 1
- c) ☐ 2
- d) ☐ 3
- e) ☐ 4
- f) ☐ 5
- g) ☐ 6
- h) ☐ 7
- i) ☐ 8 or more

Thank you for your time and feedback today! *Politely end call.*

Appendix D: Participant Recency Survey for Non-Event Day Comparison

Use three attempts at different times of the day within 51 hours of weather exceeding 90°F and no Power Manager event being called. Call times are from 10:00 a.m. to 8:00 p.m. EST or 9-7 CST Monday through Saturday. No calls on Sunday. For example, if a high temperature/no event day occurs on a Monday, calling hours for that particular non-event would be:

- *Monday 5pm-8pm Eastern (4-7 Central)*
- *Tuesday 10am-8pm Eastern (9-7 Central)*
- *Wednesday 10am-8pm Eastern (9-7 Central)*

SURVEY

Note: Only read words in bold type.

Introduction

Hello, my name is _____, and I'm calling on behalf of Duke Energy. According to our information, you presently participate in Duke Energy's Power Manager Program. This program allows Duke Energy to cycle your air conditioner when there is a critical need for electricity in the region. This is a short survey that will take about 5 minutes to complete, and the information you provide will be confidential and will help to improve the program.

1. Are you aware of your participation in the Power Manager program?

☐ Yes ☐ No ☐ DK

If no, May I please speak to the person who would be most familiar with your household's participation in the Power Manager program?

If not available, try to schedule a callback time within the 51 hour time-frame for the particular event. If transferred, begin survey from beginning (Introduction).

2. Has Duke Energy activated the Power Manager device since you joined the program? [If they ask what this means, respond with: "Duke Energy has the ability to send a signal to activate the device to cycle your central air conditioner on and off during an event." Repeat the question.]

☐ Yes ☐ No ☐ DK

3. How do you know when the device has been activated?

- i) ☐ A/C shuts down
- j) ☐ Home temperature rises
- k) ☐ The light on the meter is on
- l) ☐ Light on AC unit flashes
- m) ☐ Bill credits
- n) ☐ Lower bill
- o) ☐ Other: _____
- p) ☐ Don't know

4. Has your device been activated within the last 7 days?

☐ Yes ☐ No ☐ DK

5. At what temperature was your thermostat set to **at 3pm on <day of high temperature>?**

- r) ☐ < 65 degrees
- s) ☐ 65-68 degrees
- t) ☐ 69-72 degrees
- u) ☐ 73-75 degrees
- v) ☐ 76-78 degrees
- w) ☐ 79-81 degrees
- x) ☐ 82-84 degrees
- y) ☐ 85-87 degrees
- z) ☐ 88-90 degrees
- aa) ☐ 91-94 degrees
- bb) ☐ 95-97 degrees
- cc) ☐ 98-100 degrees
- dd) ☐ > 100 degrees
- ee) ☐ It's programmed into the thermostat.
- ff) ☐ Thermostat was turned off
- gg) ☐ Air conditioner was turned off
- hh) ☐ DK

6. Were you or any members of your household home **at that time?**

☐ Yes ☐ No ☐ DK

If no or don't know, skip to question 13.

7. Using a scale of 1 to 10 where 1 means very uncomfortable and 10 means very comfortable, how would you describe your level of comfort **on <day before high temperature>?**

1 2 3 4 5 6 7 8 9 10

b) ☐ DK

8. Using the same scale of 1 to 10 where 1 means very uncomfortable and 10 means very comfortable, how would you describe your level of comfort on **<day of high temperature>?**

1 2 3 4 5 6 7 8 9 10

b) ☐ DK

If score from Q8 is lower than score from Q7:

9. What do you feel caused your decrease in comfort?

Select all that apply:

- g) ☐ Power Manager
- h) ☐ Rising Temperature
- i) ☐ Rising Humidity
- j) ☐ Power Outage
- k) ☐ Other: _____
- l) ☐ Don't Know

10. On **<day of high temperature>**, did you or any other members of your household adjust the settings on your thermostat?

☐ Yes ☐ No ☐ DK

If yes, 10a. What temperature was it originally at, and what temperature did you set it to during the control event?

Original temperature setting: _____ degrees F

☐ DK

Adjusted temperature setting: _____ degrees F

☐ DK

11. Did you or any other members of your household turn on any fans to keep cool?

☐ Yes ☐ No ☐ DK

12. What else did you or other members of your household do to keep cool?

- l) ☐ Continued normal activities/ Didn't do anything different
- m) ☐ Turned on room/window air conditioners
- n) ☐ Closed blinds/shades
- o) ☐ Moved to a cooler part of the house
- p) ☐ Left the house and went somewhere cool
- q) ☐ Wore less clothing
- r) ☐ Drank more water/cool drinks
- s) ☐ Turned on fans
- t) ☐ Opened windows
- u) ☐ Other: _____
- v) ☐ Don't know

Now I'm going to ask you some questions about your air conditioning use.

13. How often do you use your central air conditioner? Would you say you use it ...

- g) ☐ Not at all
- h) ☐ Only on the hottest days
- i) ☐ Frequently during the cooling season
- j) ☐ Most days during the cooling season
- k) ☐ Everyday during the cooling season
- l) ☐ Don't know

14. When you think of a typical hot and humid summer day, at what outside temperature do you tend to feel uncomfortably warm?

- o) ☐ < 65 degrees
- p) ☐ 65-68 degrees
- q) ☐ 69-72 degrees
- r) ☐ 73-75 degrees
- s) ☐ 76-78 degrees
- t) ☐ 79-81 degrees
- u) ☐ 82-84 degrees
- v) ☐ 85-87 degrees
- w) ☐ 88-90 degrees
- x) ☐ 91-94 degrees
- y) ☐ 95-97 degrees
- z) ☐ 98-100 degrees
- aa) ☐ > 100 degrees
- bb) ☐ Don't know

15. At what outside temperature do you tend to turn on the air conditioner?

- p) ☐ < 65 degrees
- q) ☐ 65-68 degrees
- r) ☐ 69-72 degrees
- s) ☐ 73-75 degrees
- t) ☐ 76-78 degrees
- u) ☐ 79-81 degrees
- v) ☐ 82-84 degrees
- w) ☐ 85-87 degrees
- x) ☐ 88-90 degrees
- y) ☐ 91-94 degrees
- z) ☐ 95-97 degrees
- aa) ☐ 98-100 degrees
- bb) ☐ > 100 degrees
- cc) ☐ It's programmed into the thermostat.
- dd) ☐ Don't know

16. How old is your air conditioner?

- f) ☐ 0 to 6 years old
- g) ☐ 7 to 12 years old
- h) ☐ 13 to 20 years old
- i) ☐ over 20 years old
- j) ☐ Don't Know

17. Using a scale of 1 to 10 where 1 indicates "Very Dissatisfied" and 10 indicates "Very Satisfied", What is your overall satisfaction with the Power Manager program?

1 2 3 4 5 6 7 8 9 10

If 8 or below, 17b. Why are you less than satisfied with Power Manager?

- f) ☐ They activated my Power Manager device more often than I would like
- g) ☐ The bill credits/incentives were not large enough
- h) ☐ I was uncomfortable when my Power Manager device was activated
- i) ☐ Other: _____
- j) ☐ Don't Know

18. Using a scale of 1 to 10 where 1 indicates "Very Dissatisfied" and 10 indicates "Very Satisfied", What is your overall satisfaction with Duke Energy?

1 2 3 4 5 6 7 8 9 10

If 8 or below, 18b. Why are you less than satisfied with Duke Energy?

19. Did you experience any power outage issues on <day of high temperature>?

☐ Yes ☐ No ☐ DK

Finally, we have two short demographic questions.

20. How many people live in this home?

- i) ☐ 1
- j) ☐ 2
- k) ☐ 3
- l) ☐ 4
- m) ☐ 5
- n) ☐ 6
- o) ☐ 7
- p) ☐ 8 or more

21. How many persons are usually home on a weekday afternoon?

- j) ☐ 0
- k) ☐ 1
- l) ☐ 2
- m) ☐ 3
- n) ☐ 4
- o) ☐ 5
- p) ☐ 6
- q) ☐ 7
- r) ☐ 8 or more

Thank you for your time and feedback today! *Politely end call.*

Process and Energy Impact Evaluation of the Home Energy Comparison Report Program in South Carolina

Final Report (revised)

**Prepared for
Duke Energy**

139 East Fourth Street
Cincinnati, OH 45201

November 8, 2011

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November 8, 2011: *This report has been revised. The original version of this report presented one version of the HECR mailing as the “bar graph” version. This has been changed to be called the “index table” version.*

Executive Summary

Key Findings and Recommendations

The key findings and recommendations identified through this evaluation are presented below.

Key Findings: Customer Survey

- There were 305 customers successfully contacted for the survey. Of these, 262 (85.9%) recalled receiving the HECR report.
 - See section titled "Introduction" on page 19.
- 97.7% of the customers who recall the HECR are reading the report. If the full number of contacted customers are included in this calculation (n=305, as noted above), and the assumption is that they throw the HECR away, this brings the percent of customers reading the HECR down to 84.5% of the targeted customers.
 - See section titled "Customers Who Read the HECR and Why" on page 19.
- Before being asked about what messages or tips customers recalled from the HECR, most surveyed customers that read the report defined energy efficiency in simple terms (n=228, or 87.0%), saying "Being energy efficient means saving money" or "use the least amount of energy necessary", while some provided specific examples of what should be done to be energy efficient, such as "Using insulation and weatherstripping " and "Lowering the thermostat " (n=27, or 10.3%).
 - See section titled "Customer Opinions and Actions Regarding Energy Efficiency" on page 20.
- On average, surveyed HECR customers scored their interest in energy efficiency at a higher score than their interest in reading the HECR, unless they thought that they do less than others do to save energy. This finding is statistically significant with 95% confidence.
 - See section titled "Interest in the Energy Efficiency and the HECR" on page 24.
- About 80% of the customers overall are happy with how frequently they receive the HECR, although those that receive the HECR on a monthly basis indicate a higher level of interest in reading the next HECR, which may indicate that those reading the HECR monthly are more engaged with the HECR and therefore more interested in the HECR overall.
 - See section titled "Frequency of the HECR" on page 24.
- HECR customers' satisfaction with the HECR report does not vary significantly between those getting the Line Graph version and those getting the Index Table version. Overall satisfaction scores are high, with the most satisfaction with the reports being easy to read and understand, and with the graphics being helpful to them in understanding how their energy usage changes over the seasons.
 - See section titled "Satisfaction with HECR" on page 32.

Recommendations

- If the HECR is deployed as a fully-commercialized program, continue to refine the presentation of the comparison data through monitoring customer responses and leveraging customer surveys. Determine through these and other low-cost methods how usage data can be presented most clearly to customers. Duke Energy should keep in mind that more information is not necessarily better, and that if the desired understanding of social norms of energy use can be achieved with one calculated number, that may be enough.
 - See section titled "HECR Report" on page 14.
- Duke Energy should continually refine their selection of tips and facts to be conveyed in the HECR report. While tips directly aimed at energy savings are necessary to supplement social norm messaging, it may be useful to include other relevant and interesting facts so that customers continue to be engaged and interested. However, all messaging should be targeted at getting customers to reduce their energy use via behavior change or through technology replacement. Messages that move away from this objective can reduce the impact of all messaging and reduce program savings. Likewise, while messaging to cross-sell other Duke Energy programs is necessary to achieve the second of HECR's stated objectives, Duke Energy may need to take care not to oversell the programs, or push programs to customers who are not suitable participants. In order to determine whether customers are indeed interested and engaged versus over-saturated and numbed, Duke Energy should conduct periodic customer status surveys about these and other issues and continue to data mine the programmatic tracking systems to maximize portfolio savings.
 - See section titled "Other Report Content" on page 15.
- If cross-selling remains an objective of the HECR product at scale, then Duke Energy should formally establish a process to assess the effectiveness of HECR as a lead generation mechanism.
 - See section titled "Results" on page 17.
- Add CFL coupons to the HECR mailing if it can be shown that the participants can use additional CFLs that they are not likely to purchase on their own.
 - See section titled "Conclusions and Recommendations for Program Changes" on page 39.
- The impact evaluation discovered that as a customer's average usage increases, the level of savings from HECR also increases (see the table on the next page). Therefore, the program should target high usage customers to achieve the highest energy savings per participant using advanced segmentation analysis methods.
 - See Table 1 on page 5.

Impact Summary Tables

The energy impacts associated with the program were determined by a billing analysis using both customers that received the HECR report (the treatment group) as well as a group of

customers who did not (the control group). The billing analysis relies upon a statistical analysis of actual customer-billed electricity consumption before and after the HECR treatment period. The billing analysis used consumption data from all HECR treatment customers in South Carolina (8,258 treatment customers, 4,132 received a monthly report and 4,126 received a quarterly report). A panel model specification was used that incorporated the monthly billed energy use across time and customers. The model included standard statistical procedures to control for the effect of weather on usage, as well as a complete set of monthly indicator variables to capture the effects of non-measurable factors that vary over time (such as economic conditions and season loads).

Table 1 presents the billing data analysis estimate of the impact of the HECR program. It was observed that the impacts vary significantly depending upon the average usage of the customer, so in addition to estimating the overall impact of HECR¹, we developed estimates based upon the average usage of the customer as well as the frequency of the report (monthly or quarterly) and type (Index versus Line).

Table 1. Usage Level and Annual Savings Summary

Usage Level	Annual kWh Per Participant Savings	T-Value
Overall	147 kWh	5.59
daily use <20 kWh	41 kWh	1.07
daily use >=20 but <30 kWh	32 kWh	0.81
daily use >=30 but <40 kWh	173 kWh	3.71
daily use >=40 but <50 kWh	53 kWh	0.98
daily use >=50 but <60 kWh	233 kWh	3.18
daily use >=60 but <70 kWh	160 kWh	1.49
daily use >=70 but <80 kWh	225 kWh	1.39
daily use >=80 but <90 kWh	288 kWh	1.09
daily use >=90 kWh	443 kWh	1.53

Table 2. Annual Savings by Report Frequency and Type

Report Frequency	Report Type	Annual kWh Per Participant Savings	t-value
Monthly	Line	211	4.42
	Index	229	4.82
Quarterly	Line	70	1.48
	Index	77	1.59

¹ The overall savings was determined by estimating the model over all customers, irrespective of their usage group. Therefore, it captures the proportion of customers in each group, the savings of that group, and also the variability of savings in each group. Therefore, it need not equal the population weighted average savings by usage group.

These results show that overall, the HECR program results in statistically significant savings of 147 kWh/year per customer. In addition, when looking at this by the average (pre-program) usage of the customer, there are a few customer groups that do not show any statistically significant change in usage, while there are other groups, at both the highest usage and lowest usage range, that show significant savings. Indicating that annual consumption alone may not be the sole driver of impacts and other demographics can be explored to target maximized savings.

Introduction and Purpose of Study

Summary Overview

This document presents the evaluation report for Duke Energy's Home Energy Comparison Report (HECR) Program as it was administered in South Carolina for customers that began participation in May of 2010.

Summary of the Evaluation

This document presents the evaluation report for Duke Energy's HECR Program as it was administered in South Carolina. The evaluation was conducted by TecMarket Works with assistance from Integral Analytics and Yinsight. The survey instruments were developed by TecMarket Works. The survey was administered by TecMarket Works. The impact analysis was conducted by Integral Analytics. Yinsight (a TecMarket Works subcontractor) conducted the in-depth interviews with program management.

Evaluation Objectives

The purpose of this evaluation is to provide feedback that can help the program provider consider changes to the program that can help achieve improvement in cost effective operations, help understand program impacts and obtain an understanding of customer related conditions and satisfaction.

Researchable Issues

In addition to the objectives noted above, there were a number of researchable issues for this evaluation. These include:

1. To solicit feedback from program participants about their experience with the HECR mailings, such as their recollection of the messages and tips, their home energy scores, and their satisfaction with the reports.
2. To gain an understanding of customer demographic categories responding positively to the HECR program.
3. To determine which report (Index or Line graph formats) performs best, and at which frequency (monthly or quarterly).

Description of Pilot Program

The Home Energy Comparison Report Program is a pilot being rolled out in some of Duke Energy's jurisdictions; however this report focuses on early insights from the South Carolina pilot program.

The purpose of the pilot is to determine whether receiving comparative usage data for similar residences in the same geographic area motivates customers to better manage and reduce energy usage. The pilot is structured to target a sample of customers residing in individually-metered, owner-occupied, single-family residences served on Duke Energy South Carolina's residential rate schedules. The initial pilot also excluded any customers who had previously participated in a Duke Energy energy efficiency program, in an effort to obtain pure "behavioral" impacts². Duke Energy, through proprietary techniques, compiles energy usage and publicly available information (location, size, home age, occupancy) on nearby similar homes to develop the comparisons. Reports are mailed to the residence in one of two formats, either monthly or quarterly. The reports contain personalized tips and messages³ based on customers' energy usage patterns, information about their homes, as well as follow up opportunities such as an offer to participate in Duke Energy's audit programs

Pilot Program Participation

The initial treatment group consisted of 8,258 SC customers in 2010. This group was divided into two groups. One group received quarterly feedback reports and the second received monthly reports. Each of those groups were in turn further divided into one of two types of reports, with one report showing usage data in line formats while the other group received their information in a score and Index chart format. Examples of these HECR formats are presented in Appendix C: Sample HECR Mailing: and Appendix D: Sample HECR Mailing: Line Graph.

The groups and the group populations used in this analysis are presented below in Table 3. A total of 8,258 treatment customers were included in the impact analysis.

Table 3. HECR Treatment Group, 2010

	Index Chart & Score	Line Chart
Monthly	2,070	2,062
Quarterly	2,032	2,094

² Duke Energy's EE Participation database is first in class regarding the tracking of customer participation at an individual level, allowing for a holistic view of customer participation. This data was then used in the impact analysis to further insure no "double counting" of impacts.

³ See section "Tips and Messages" for a presentation of the differences between tips and messages.

Methodology

Overview of the Evaluation Approach

This evaluation has three components: management interviews, participant surveys, and an impact analysis.

Study Methodology: Process

The process evaluation has two components: management interviews and participant surveys. In-depth interviews were conducting with program management, and the participant surveys were conducted with 262 customers in South Carolina.

TecMarket Works developed a customer survey for the HECR Program treatment group customers, which was implemented from December 2010 through February 2011.

The complete survey was conducted with a random sample of 262 HECR customers. When the customer was successfully contacted, the surveyor asked that customer if they were familiar with the HECR mailings. If not, the surveyor provided a short description of the HECR mailings they have been receiving: *"This program provided information on how much electricity you used in the previous month⁴ and in the previous 12 months compared to your neighbors and provided tips on how you could lower your electricity use and costs in becoming more energy efficient."* If the customer still did not recall the HECR, they were thanked for their time and the call was terminated. If they did recall the HECR, the survey continued regardless of whether they read the HECR. There were 262 customers out of 305 contacted that recalled receiving the HECR (85.9%).

HECR customers were surveyed by TecMarket Works. The survey can be found in Appendix B: HECR Customer Survey Instrument.

Study Methodology: Impact

The analytical method employed to evaluate the impacts relied upon a panel data approach where data are available both across households (i.e., cross-sectional) and over time (i.e., time-series). With this type of data, it becomes possible to control, simultaneously, for differences across households as well as differences across periods in time through the use of a "fixed-effects" panel model specification. The fixed-effect refers to the model specification that allows different variables across homes that do not vary over the estimation period (such as square footage, heating system, etc.) to be explained, in large part, by customer-specific intercept terms that capture the net change in consumption due to the program, controlling for other factors that do change with time (e.g., the weather).

The fixed effects model can be viewed as a type of differencing model in which all characteristics of the home, which (1) are independent of time and (2) determine the level of energy consumption, are captured within the customer-specific constant terms. In other words, differences in customer characteristics that cause variation in the level of energy consumption,

⁴ Or quarter, depending on how frequently the contacted customer was receiving the HECR.

such as building size and structure, are captured by unique constant terms representing each unique household.

Algebraically, the fixed-effect panel data model is described as follows:

$$y_{it} = \alpha_i + \beta x_{it} + \beta^* treat_{it} + \beta' T + \varepsilon_{it} \quad (1)$$

where:

y_{it}	=	the electricity use for home i during month t (normalized by the number of days in that month)
α_i	=	constant term for site i
β, β'	=	vectors of coefficients
x_{it}	=	vector of variables that represent factors causing changes in energy consumption for home i during month t (i.e., weather)
T	=	A vector of monthly indicators for all months in the model. This is included to capture trends in electricity use over time across all customers that cannot be captured by weather terms or post-treatment variables. These terms lessen the possibility of biased impact estimates from the influence of omitted variables.
β^*	=	the coefficient indicating the effect of the program
$treat_{it}$	=	a variable indicating that home i received treatment during month t
ε_{it}	=	error term for home i during month t .

The weather terms included in the model are the heating and cooling degree days for that month, tied to the customer location, and to capture the overall trend in electricity usage, monthly indicator variables were used for each month in the analysis (i.e., time effects).

Data collection methods, sample sizes, and sampling methodology

Process

The complete survey was conducted with a random sample of 262 HECR customers. The survey protocol can be found in Appendix B: HECR Customer Survey Instrument. We attempted to contact program participants by telephone no more than five times at different times of the day and different days before dropping them from the randomly sampled contact list. Call times were from 10:00 a.m. to 8:00 p.m. EST Monday through Saturday.

Impact

The impact evaluation used monthly billing data for all 8,258 HECR treatment customers. The control group, designed by the evaluation team, consisted of almost 27,000 customers, all of which were eligible for the program, but were not assigned to the treatment group.

Number of completes and sample disposition for each data collection effort

The complete survey was conducted with a random sample of 262 HECR customers. TecMarket Works set a target of 63-65 completed surveys in each of four groups to reach a minimum total of approximately 250 completed surveys. The four groups are:

1. Customers receiving Index Chart HECR on a monthly basis.
2. Customers receiving Index Chart HECR on a quarterly basis.
3. Customers receiving Line Graph HECR on a monthly basis.
4. Customers receiving Line Graph HECR on a quarterly basis.

Table 4. Number of Completed Surveys by Customer Group

HECR Type	Monthly HECR Targets	Quarterly HECR Targets	Monthly HECR Completed	Quarterly HECR Completed
Index	63-65	63-65	64	65
Line	63-65	63-65	67	66

Expected and achieved precision

Both the expected and achieved precision is $90\% \pm 10\%$ for the HECR program in total.

Description of measures and selection of methods by measure(s) or market(s)

This pilot program does not include any energy efficient measures. The HECR program consists of regular mailings to a targeted list of customers as described above. Methods of information delivery (index or line graphs) and frequency of delivery (monthly or quarterly) varied.

Threats to validity, sources of bias and how those were addressed

Since all the customers that received the HECR treatment start the program at the same month and receive a report each month, there is no variation in the treatment period across the treatment customers. Thus, it is impossible to differentiate the effect of the treatment from non-program effects during the same period. Therefore, the evaluation of HECR required the development of a non-treatment (i.e., control group) to disentangle the program impacts from other macroeconomic impacts. The control group selected by the evaluation team, consisted of customers randomly sampled from HECR eligible customers that were not given the report.

While including a non-participating control group in a statistical analysis of an energy efficiency program generally introduces self-selection bias, this was not the case for this study of the HECR. Since customers were randomly assigned into the treatment or control group, there was no decision by the customer to be part of either group. Therefore, there is no self-selection, and no possibility for bias from self-selection.

In order to control for month-to-month non-program impacts, the statistical model included both weather and indicator terms for each month in the model. The indicator terms capture the non-weather related factors that influence a customer's electricity independent of whether or not the customer was part of HECR. Thus, the model controls for such effects as the general economic condition.

Freeridership

Finally, since individuals are randomly assigned to the treatment group, there is no issue of free ridership. This random assignment, plus the large number of customers in the treatment group and the fact that not all HECR customers went on to participate in other Duke Energy programs during the treatment period, implies that there is no need to include in the model variables that capture participation in other energy efficiency programs. The HECR participant and non-participant both have equal opportunity to participate in other programs. The use of random assignment into the test and control groups (conducted by the evaluation team) suggests that both the test and control group would have equal predictability of participation in other programs and offset each other in the analysis efforts as a baseline condition for both groups.

Snapback and Persistence

The theoretical additional energy and capacity used by customers that may occur from implementing an energy efficiency product, often called "snapback" if it occurs, is by design already captured in the impact evaluation through the billing analysis approach. The billing analysis approach uses actual energy use between the pre and post condition compared to what would occur without the program (control). All market or program effects conditions, including snapback, are already accounted for in this evaluation method. Further, there is little to no literature or snapback analysis within the evaluation industry that has been able to identify a snapback condition. The so-called snapback that has recently been referenced in the press has been the impact of normal electric demand growth that shows up in all customers as new products, services, and technologies are acquired and used. However, as noted above, any snapback that does occur would be captured in the evaluation design because of the use of pre and post billing analysis.

Persistence of the HECR impacts, without a treatment effect (continued reports delivered) is relatively unknown with these types of reports, however persistence can be measured over time by extended use of a time series analysis efforts. The studies that have been conducted indicate that the savings remain for at least a year. Beyond this we have little evidence to support a longer projection of persistence, nor do we have the data to develop an algorithm for how persistence erodes. These studies are now in the field and we hope to have some results within the evaluation field in the next year or two. At this time the evaluation field is projecting savings to last at least one year, but probably beyond a year. At this time our analysis assumes one year of savings persistence.

Evaluation Findings

Process Evaluation

Interviewees

For the process evaluation, in-depth interviews were conducted with three Duke Energy program managers, a Duke Energy database administrator, and one market analyst consultant.

Program Description

The Home Energy Comparison Report (HECR) is a pilot designed to achieve two objectives. First, provide customers with information that will produce behavioral changes to reduce residential energy. Second, cross sell Duke Energy's other energy efficiency programs. A Duke Energy program manager reports that their overall goal is to become an energy partner with the customer, rather than just a utility to whom they write a check every month.

The HECR pilot was designed to run for a full year, starting in May of 2010 with approximately 8,000 customers. Half of these customers receive the HECR report on a monthly basis, the other half receive it on a quarterly basis. Duke Energy had started a similar HECR pilot in Ohio a few months earlier, and the South Carolina HECR was able to leverage some improvements learned from Duke's Ohio HECR pilot.

At the time of the interviews, Duke Energy was in the middle of determining the basis for development of HECR as a full program. The program manager reports that the HECR team is working on a business case for a full HECR program, with the decision to be made in the spring of 2011.

Program Design and Theory

A Duke Energy program manager reports that during the design phase, the HECR team referenced many different programs, the primary one being the existing Personalized Energy Report program (PER[®]). PER[®] had already been providing customers with comparison information, but only for the "average" Duke Energy residential customer on a regional level, not for "similar" homes. The key differentiator for HECR is the addition of data comparing the customer's energy usage to those of similar homes in their area. This comparison allows customers to see whether their usage is higher or lower than the average home like theirs. Customers are also presented with usage data from the most efficient similar homes as another point of comparison. The HECR team also referenced "neighborhood" comparison report programs offered by third party vendors, but decided to implement the HECR pilot in-house so that they could rapidly make tactical changes as they were developing the pilot without incurring additional costs.

The program's theory for successful energy reduction rests upon the concept of "social norms". A large body of research in the social sciences has shown that people tend to conform to the social norms around them, even if they may overtly deny any influence. A number of companies recently have leveraged this effect and found that customers can reduce energy use anywhere between 1.5 to 2.5% when they can compare their energy usage to the social norm of similar homes. However, due to the relative infancy of this methodology, there is very little longitudinal

data about the persistence of these energy savings. Also, as more and more utilities implement comparison report programs, they are beginning to find that customers respond differently to these reports. One provocative analysis of a utility comparative energy report program by a UCLA economist suggested that if the comparison report presented saving energy as an objective that would help the environment, those customers who identified themselves as politically conservative actually increased their energy use⁵. Likewise, early results from the impact analysis indicate that some market segments increase their consumption when given comparative information. The HECR team is aware that customers must be carefully targeted to a subset of the residential market who would respond favorably to the comparison report in order for the program to produce reliable and predictable savings. Duke Energy is currently in the process of refining their targeting approach for future testing.

HECR Report

The HECR report was a one page report containing energy saving tips and charts comparing the customer's energy use with others. Duke Energy leveraged its internal analytics department resources which includes outside consultants to develop the analytical framework that was used to generate the comparisons. This framework defines which homes are considered "similar", what home is considered "average", how to quantify concepts such as "average usage of a similar home" and the "average usage of an efficient home."

"Similar homes" was defined to consist of at least 100 homes that are similar across four main characteristics: their heat source, home square footage, age of home, and number of occupants. In more densely populated areas where houses are very similar to one another, there may be over 1,000 similar homes. Geography is also factored into the targeting comparison. For example, customers in rural outlying areas are compared to similarly located homes with similar latitude and longitude. "Average" was defined as the statistical median. "Efficient" homes were originally identified as those homes in the top 10% of efficiency (energy use per home segment). Customers began calling to give the HECR team feedback on how unrealistic the 10% standard was. HECR heeded the feedback and changed the definition so that homes in the top 25% were considered efficient.

Charts. The results of the comparison analyses were displayed in two ways. In the "line chart" method, a customer's last 13 months of kWh energy usage is displayed in a line chart, along with the usage of the "average" and "efficient" similar homes. In the "index" version, customers are shown their level of efficiency as a number between 0 and 100.

The HECR team tested different scoring algorithms in the beginning months of the program. TecMarket Works believes it is important to leverage information and early feedback findings from Duke Energy's other jurisdictions to improve the South Carolina HECR program. The South Carolina and Ohio HECR programs use different scoring algorithms and the market analytics consultant reported that the HECR team learned that the Ohio score, representing a rolling average of the past 24 months of energy use, was confusing to the customer. In response

⁵ Costa, D. L., and Kahn, M. E. (2010). Energy conservation "nudges" and environmentalist ideology: Evidence from a randomized residential electricity field experiment. NBER Working Paper No. 15939. Available at . Vox EU, policy portal set up by the Centre for Economic Policy Research. Available at <http://www.nber.org/papers/w15939>. See also <http://www.voxeu.org/index.php?q=node/5064>

to that feedback, in South Carolina, the score was based upon usage for a single month, and can be treated as a snapshot of energy use. The market analyst reports that the South Carolina customers found their score easier to understand. However, informal customer feedback suggests that the line chart was still superior to either version of the scores.

The market analyst points out that the critical issue is not about the calculations. *“It’s not about which is more accurate. It’s about how customers react to each of them.”* At the time of the process evaluation interviews, Duke Energy has yet to decide whether they want to use both the score and the line chart in a fully-commercialized version of HECR⁶.

RECOMMENDATION: If the HECR is deployed as a fully-commercialized program, continue to refine the presentation of the comparison data through monitoring customer responses and leveraging customer surveys. Determine through these and other low-cost methods how usage data can be presented most clearly to customers. Duke Energy should keep in mind that more information is not necessarily better, and that if the desired understanding of social norms of energy use can be achieved with one calculated number, that may be enough.

Other Report Content

The HECR also provides tips on saving energy. In South Carolina, these tips are customized to each region of the state rather than to each customer. The SC report has two message boxes that contain tips on savings energy and fast facts about energy use. These tips are written by a technical writer, and the Duke Energy program manager is able to assign to the writer which current and regional actions should be incorporated into the tips.

The market analyst consultant who developed the analytical framework explains that Duke Energy has made a distinction between behavior and structural efficiency. Buying a new heater and replacing a window affect structural efficiency, even though “buying” and “replacing” are behaviors. The HECR attempts to achieve its energy savings goals through conservation behavior.

One HECR staff member reports that they tested the report with a focus group. Another manager reports that the tips seemed a little “sales-y” and were not all aimed at getting customers to save energy.

RECOMMENDATION: Duke Energy should continually refine their selection of tips and facts to be conveyed in the HECR report. While tips directly aimed at energy savings are necessary to supplement social norm messaging, it may be useful to include other relevant and interesting facts, such as checking to see whether a new TV is set to a brighter “retail mode” or the more efficient “home mode”, so that customers continue to be engaged and interested. However, all messaging should be targeted at getting customers to reduce their energy use via behavior change or through technology replacement. Messages that move away from this objective can reduce the impact of all

⁶ After these interviews were completed, Duke Energy’s HECR team made the determination that any new commercialized HECR program would only use the line chart.

messaging and reduce program savings. Likewise, while messaging to cross-sell other Duke Energy programs is necessary to achieve the second of HECR's stated objectives, Duke Energy may need to take care not to oversell the programs, or push programs to customers who are not suitable participants. In order to determine whether customers are indeed interested and engaged versus over-saturated and numbed, Duke Energy should conduct periodic customer status surveys about these and other issues and continue to mine the programmatic tracking systems to maximize portfolio savings.

Explaining Comparisons

Included in each report is a sidebar that explains to the customer who they are being compared against. Under the heading "Whose electricity usage is being compared to mine?" are statistics about the "similar" homes' characteristics including geographic area, type of housing (e.g. single family), type of heat (electric or non-electric), square footage of the homes, and the age ranges of the homes, and the number of homes.

Customer Feedback

HECR staff has attempted to verify home information in the Report by sending a business reply card with one report. Through this process they found that their records on the square footage of homes in South Carolina was not always accurate. A few customers said they had done all they could to improve energy efficiency and didn't want to continue receiving report, a few customers called to say their home characteristics were incorrect. However, a Duke Energy program manager reports that they received customer feedback that was generally positive: *"Folks liked being able to know where they stand."*

Report delivery

In order to test whether frequency of messaging affected customer behavior change, half the customers received a monthly report while the other half received a quarterly report.

Reports are sent out to customers on an opt-out basis (i.e., they can ask to be excluded from receiving the information); HECR staff report that as of May 12, 2011, there have been only 35 customers who called Duke Energy to opt out.

Duke Energy's quality assurance procedures included tracking "seeds" that were sent out with every mailing, to ensure that the mail drops were made on the expected dates. Duke Energy also sent out business reply cards to check if customers needed to make other corrections to their records.

Program Staff View of Improvements to be Considered

The market analyst reports that the HECR team has had some difficulty getting billing data in a timely manner from the data warehouse. Because customers need to be provided with their past month's energy usage, there is only a small time window in which the data must be processed and analyzed. The HECR team's data needs were constantly changing: *"Because this was a pilot, everything changed each month."* The market analyst interviewed for this assessment reports that it is unclear at this point whether the necessarily flexibility could be built into Duke Energy's IT system, and it is unclear whether HECR's data needs can be settled so that flexibility would not

be needed in the future. The interim solution was for Duke Energy to build a separate database as a “data test ground”, using a separate server with no backups.

The Duke Energy program manager reports that they are considering whether HECR might be delivered online or via digital devices, to reduce program costs associated with mailing the reports.

Results

At the time of these interviews in late 2010, the program staff had not yet begun analyzing the impact of the program. The program was designed to support rigorous analysis of savings impact. Analyzing the success of HECR’s cross-selling aspects are planned for the future, after enough time has occurred to allow a statistical analysis of cross-program participation between participants and non-participants. The new Duke Energy program manager reports that for a commercial launch, cross-selling effects will be analyzed at a high level: this means they are not intending to map individual participants from HECR to other programs on a one-to-one basis. Instead, they plan to look at overall increase in cross program participation for HECR participants as a group, compared to non-participants.

HECR experimental design for impact analysis. The HECR pilot controlled for extraneous factors by assigning another population of customers to act as a control to the test group of report recipients. Due to random sampling techniques, these control group customers can safely be assumed to be similar to the test group customers in every way, except they do not receive the HECR report. By using a randomly selected test and control group, by the evaluation team and not the implementer, any energy use difference between the two groups may be attributed to the HECR report’s influence.

The market analyst reports that to determine the test and control groups, the pool of all eligible customers was first divided into approximately 1,000 smaller groups of about 80-100 customers each. Then, 1/3 of these groups were randomly assigned to receive the report, with the remaining 2/3 of the groups acting as controls.

Cross selling. Interviewees mentioned two programs that HECR had promoted. The Energy Solutions @ Home program is a home audit targeted at making improvements to a building’s envelope. HECR promoted the Energy Solutions @ Home[®] program by encouraging people to go to the Energy Solutions[®] program, but have not yet heard whether their promotions have generated any inquiries. However, there are no formally-established processes to track the success of cross-promotions. Likewise, a Duke Energy program manager reports that they used HECR to push PER[®], but (as noted earlier) they had not evaluated the success of those efforts yet.

Future of HECR Pilot

One Duke Energy program manager reports that Duke Energy is developing a strategy to coordinate their several residential home energy report offerings. In this strategy, HECR would constitute a Level 1 program with basic information pulled from databases. PER[®] would constitute a Level 2 program, with database information supplemented by information that is gathered directly from the customers.

In a follow-up interview conducted in early 2011, one HECR staff reports that Duke Energy had received regulatory permission to continue the South Carolina pilot past the original one year duration while the impact evaluations are completed. However, the new HECR program manager reports that HECR will need await analysis of final impact results and undergo a stage-gate review by senior management prior to final approval. In view of the generally small levels of savings from these types of programs (1-4%), and because savings are often dependant on segmentation and targeting strategies, this delay reflects sound judgment on the part of Duke Energy. The use of indiscriminate targeting approaches can result in increased energy consumption rather than decreased consumption. Duke Energy reports that they hope the commercial launch of the South Carolina HECR will be in early fourth quarter of 2011, to anywhere between 88,000 to 150,000 customers. The actual launch size will be determined after the HECR staff makes refinements to their customer targeting, to identify those customers who would be most likely to respond positively to the comparison report.

Results From HECR Customer Surveys

Introduction

TecMarket Works conducted telephone surveys with 262 randomly selected program participants in the state of South Carolina from mid-December 2010 through early February 2011. This section presents the results from the surveys. The survey instrument can be found in Appendix B: HECR Customer Survey Instrument.

When the customer was successfully contacted, the surveyor asked that customer if they were familiar with the HECR mailings. If not, the surveyor provided a short description of the HECR mailings they have been receiving: *"This program provided information on how much electricity you used in the previous month⁷ and in the previous 12 months compared to your neighbors and provided tips on how you could lower your electricity use and costs in becoming more energy efficient."* If the customer still did not recall the HECR, they were thanked for their time and the call was terminated (n=42, or 13.9% did not recall the program reports). If they did recall the HECR, the survey continued regardless of whether they read the HECR. There were 262 customers out of 305 contacted that recalled receiving the HECR (85.9%).

The results from the full 262 completed SC surveys are presented below, with the results of one partial survey included as applicable⁸. Also, there are a number of questions that were only asked if the survey respondent was able to recall any of the tips or messages, or if they read the HECR mailing. Therefore, the number of respondents answering a question varies, and are presented as appropriate to the context throughout this section. The responses below are segregated into two groups: those that received index chart comparison reports and those that received line graph reports.

Table 5. Number of Completed Surveys by Customer Group

HECR Type	Monthly HECR Targets	Quarterly HECR Targets	Monthly HECR Completed	Quarterly HECR Completed
Index	63-65	63-65	64	65
Line	63-65	63-65	67	66

Customers Who Read the HECR and Why

Almost all of the surveyed customers report that they read the HECR when they receive it. Over all HECR types⁹, 97.7% of the customers responding to the survey and who remember the reports are reading them. If the full number of contacted customers are included in this calculation (n=305, as noted above), and it is assumed that they throw the HECR away, this brings the percent of customers reading the HECR down to 84.5% of the targeted customers. Table 6 below shows the percent of surveyed customers that read the HECR when they receive it, by type and frequency of their reports. Over 95% of all HECR customer groups read the reports.

⁷ Or quarter, depending on how frequently the contacted customer was receiving the HECR.

⁸ One contact was not able to complete the full survey, but the responses from that partial survey are still presented when a response to the question was provided.

⁹ Monthly Index, Monthly Line, Quarterly Index, Quarterly Line

Table 6. Customers That Read the HECR

HECR Type	Monthly HECR Count	Monthly HECR Percent	Quarterly HECR Count	Quarterly HECR Percent
Index	64	100.0%	62	95.4%
Line	64	95.5%	66	100.0%

We asked surveyed customers who read the HECR why they read it. Almost 30% of them say they are reading it to see the comparison made to other's energy usage.

A list of the responses is below with the number and percentage¹⁰ of customers providing each of the responses.

- "To see the comparison with other's energy usage." (N=77, 29.4%)
- "To see the comparison with other's energy usage, and how my energy use changes over time." (N=16, 6.1%)
- "To see my energy use over time." (N = 9, 3.4%)
- "I want to lower my energy bills." (N = 8, 3.1%)
- "I'm curious about the information provided." (N = 5, 1.9%)
- "I have made improvements and want to see the results." (N = 3, 1.1%)
- "I want to save energy and lower my bills." (N = 3, 1.1%)
- "To see how energy efficient my home is." (N = 3, 1.1%)
- "To understand why my bills are so high." (N = 2, 0.8%)
- "Because it comes with my bill." (N = 1, 0.4%)
- "For a good laugh, the reports are stupid and inaccurate." (N = 1, 0.4%)
- "Selling my house and will use information to market it." (N = 1, 0.4%)
- "To show my children how much energy they waste." (N = 1, 0.4%)

The six surveyed customers that reported they throw the HECR away provided the following reasons for not reading the HECR:

- "I'm too busy/don't have time."
- "It's too confusing."
- "Too low a priority for me."
- "I am already more efficient than average."
- "I get too much mail."
- "It is always the same."

Of the six customers that throw out the HECR, one of them (17%) said that they did read them at one time, but have stopped reading them because "I get too much mail."

Customer Opinions and Actions Regarding Energy Efficiency

We asked surveyed HECR customers if they thought that their efforts to decrease their energy consumption were about the same, more, or less than what others typically do to save energy.

¹⁰ Percentages do not add up to 100% due to rounding.

The question was worded as *"When you consider the efforts you and your household make to decrease your energy consumption at your home, do you feel that on average your efforts are less than what others typically do, about the same as what others typically do, or more than what others typically do?"*. The results are presented in Table 7. For those customers that throw out the HECR, the responses are evenly distributed. Of customers that read the HECR, the highest percentage (46.9%) believes that they do about the same as others do to be more energy efficient. About 5% believe that they do less than others. This suggests that most customers still believe they are doing the same or more than others with regard to efficiency and few believe they are doing less. Also customers that believe they are doing more are more likely to read the report. As a result it may be the case that customers that have participated in an efficiency program may be a good candidate for the reports in the future.

Table 7. HECR Customers' Perceived Energy Efficiency Actions

	More Than Others	Same As Others	Less Than Others	Don't Know	Total
Read It	104	120	13	19	256
Throw It Away	2	2	2	0	6
Percent					
Read It	40.6%	46.9%	5.1%	7.4%	100.0%
Throw It Away	33.3%	33.3%	33.3%	0.0%	99.9%

We asked all surveyed customers to define, in their own words, "what it means to be energy efficient". The responses for those that do not read HECR are below.

- "Being aware of energy use."
- "Use the least amount of energy necessary."
- "Being cautious about cooling & heating decisions."
- "Try to use less energy."
- "Don't waste energy or water."
- "Don't waste energy."

Most surveyed customers that read the HECR defined energy efficiency in simple terms (n=228, or 86.7%), saying "Being energy efficient means saving money" or "use the least amount of energy necessary", while some provided specific examples of what should be done to be energy efficient, such as "Using insulation and weatherstripping " and "Lowering the thermostat " (n=27, or 10.3%). A list of responses (mentioned by at least two people) from surveyed customers who read HECR is below.

Non-Specific Responses, n=228

- "Being energy efficient means saving money." (N= 66)
- "Use the least amount of energy necessary." (N= 39)
- "Don't waste energy." (N= 38)
- "Try to use less energy." (N= 20)
- "Being energy efficient means saving money and helping the environment." (N= 13)
- "Conserving energy." (N= 8)

- "I do not know." (N= 8)
- "Try to use less energy while staying comfortable." (N= 5)
- "Conserving energy and natural resources." (N= 4)
- "Using resources wisely." (N= 4)
- "Getting more for less." (N= 3)
- "Saving energy and going green." (N= 3)
- "Being aware of energy use." (N= 2)
- "Cutting back on our energy use." (N= 2)
- "Don't be an energy hog." (N= 2)
- "Don't waste energy and help Duke Energy." (N= 2)

Specific Responses, n=27

- "Using insulation and weatherstripping to stay comfortable and save energy." (N= 5)
- "Lowering the thermostat and keeping windows sealed." (N= 3)
- "Using CFLs and lowering the thermostat." (N= 3)
- "Keeping my house sealed and insulated." (N= 2)
- "Turning off unnecessary lights and appliances." (N= 2)
- "Turning off unnecessary lights and having proper insulation." (N= 2)
- "Using energy efficient equipment" (N= 2)

Additional (all n=1) responses can be found in Appendix E: What It Means to be Energy Efficient.

We asked surveyed customers what they do to be more energy efficient. The question of "*What do you do to be more energy efficient?*" was repeated to allow for up to four responses. The full list of responses can be found in Appendix F: What Surveyed Customers Do to be More Energy Efficient.

While most respondents could provide three or four things that they have done to reduce consumption (60.2%), a very small percent of surveyed customers (11.2%) were only able to identify one thing that they did to be more energy efficient, with the most common self-reported energy efficient action being to "turn off lights". Most surveyed customers were able to provide 3 actions or measures, as presented in Figure 1 below.

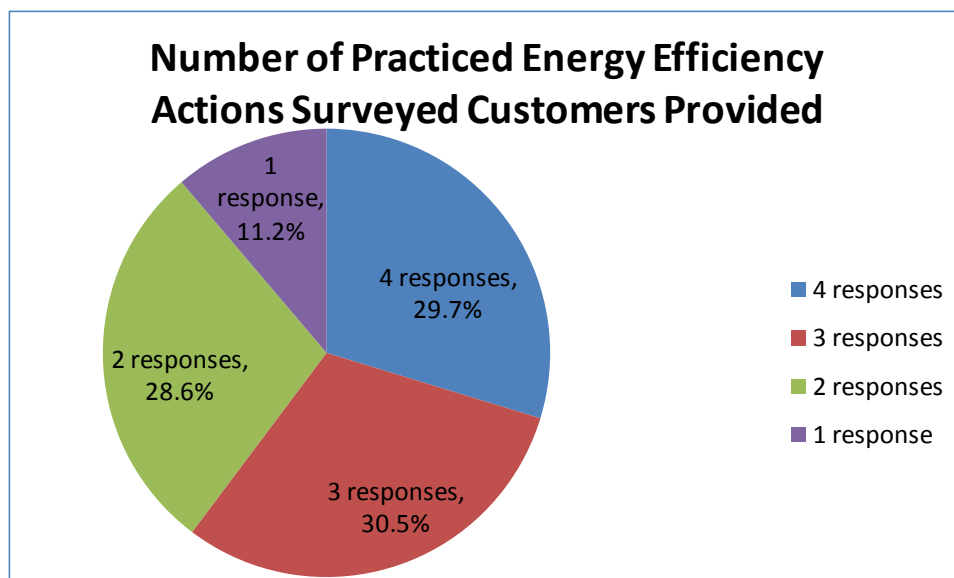


Figure 1. Number of Practices Energy Efficient Actions or Measures Taken by Surveyed Customers

There were a total of 722 energy efficient actions taken reported by the 262 customers surveyed (mean=2.76 per person). The most common responses (n=10 or more customers) are summarized in Figure 2 below. The full list of 722 actions is presented in Appendix F: What Surveyed Customers Do to be More Energy Efficient. The most common customer response was "turn off lights", with 45.8% reporting this action. Other common responses include "lower the thermostat" with 34.0% reporting they do this, and 29.8% of the surveyed HECR customers use CFLs in their homes.

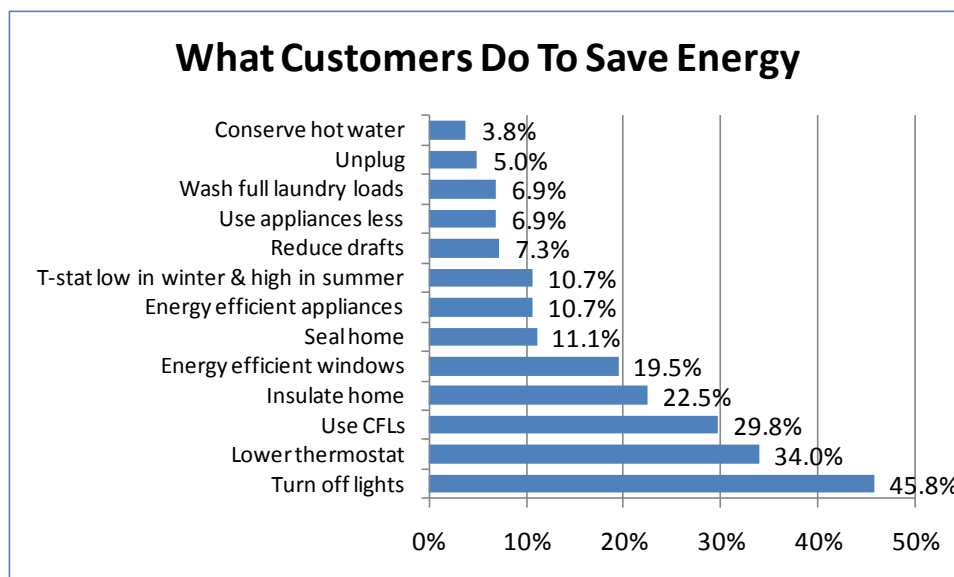


Figure 2. What Surveyed Customers Do To Save Energy (n=262)

Interest in the Energy Efficiency and the HECR

We asked surveyed HECR customers about their interest in energy efficiency and their interest in reading the next HECR they will receive. Customers were asked to rate their interest on a 1-10 scale, with 1 meaning "very uninterested" and 10 meaning "very interested". On average, surveyed HECR customers scored their interest in energy efficiency at a higher score than their interest in reading the HECR unless they thought they did less than others to conserve energy. This group was more interested in reading the next HECR than they were in energy efficiency in general. Overall, the difference in interest is statistically significant as shown in Table 9. Table 8 below presents the mean interest scores for all surveyed customers by whether or not they read the HECR, and by their self-reported energy efficiency actions compared to others. For example, those that say they do "less than" others when it comes to decreasing their energy consumption have the lowest mean interest in energy efficiency score.

Table 8. Mean Customer Interest in Energy Efficiency and Reading the HECR

	Interest in Energy Efficiency	Interest in Reading the Next HECR
All Surveyed Customers		
Read It	8.65	8.10
Throw It Away	7.33	5.80
Surveyed Customers Indicating EE Actions are "About the Same" as Others		
Read It	8.33	7.78
Throw It Away	5.50	2.50
Surveyed Customers Indicating EE Actions are "Less Than" Others		
Read It	8.08	8.77
Throw It Away	6.50	7.00
Surveyed Customers Indicating EE Actions are "More Than" Others		
Read It	9.13	8.65
Throw It Away	10.00	10.00
Surveyed Customers Indicating EE Action Comparison to Others is "Don't Know"		
Read It	8.42	6.63
Throw It Away	-	-

Table 9. One-Sample Test of the Difference in Interest

Interest In:						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
EE	84.344	255	.000	8.64844	8.4465	8.8504
HECR	60.275	255	.000	8.10156	7.8369	8.3663

Frequency of the HECR

Table 10 below presents the number of surveyed HECR customers who indicated they read the HECR and their preferences on the frequency in which they receive the HECR, along with that group's mean interest score (in reading the next HECR). About 80% of the customers overall are happy with how frequently they receive the HECR, although those that receive the HECR on

a monthly basis (rather than quarterly) indicate a higher level of interest in reading the next HECR, which may indicate that those reading the HECR monthly are more engaged with the HECR and therefore more interested in the HECR overall compared to the customers who receive the quarterly reports.

Table 10. Frequency of the HECR

Customer Preference	Monthly		Quarterly		Overall
	Index (n=64)	Line (n=64)	Index (n=62)	Line (n=66)	
Don't Want to Get Any	N=6	N=2	N=2	N=0	N=10
Percent	9.4%	3.1%	3.2%	-	3.9%
<i>Interest Score</i>	3.0	3.0	3.0	-	
Less Frequently	N=9	N=11	N=1	N=5	N=26
Percent	14.1%	17.2%	1.6%	7.6%	10.2%
<i>Interest Score</i>	6.8	6.3	4.0	5.2	
Same Frequency	N=49	N=51	N=54	N=51	N=205
Percent	76.6%	79.7%	87.1%	77.3%	80.1%
<i>Interest Score</i>	8.8	8.9	8.1	8.3	
More Frequently	N=0	N=0	N=5	N=9	N=14
Percent	-	0%	8.1%	13.6%	5.5%
<i>Interest Score</i>	-	-	9.4	9.3	
Prefer E-mail Version	N=21	N=13	N=13	N=18	N=65
Percent	32.8%	20.3%	21.0%	27.3%	25.4%

Of the monthly HECR customers that would prefer to get the HECR less frequently, two indicated they would like to get it twice a year, 14 indicated they would prefer to receive the HECR quarterly or a few times a year, and 3 said every other month would be preferable. One customer said that only once (ever) would be preferable.

Of the quarterly HECR customers that would prefer to get the HECR less frequently, two indicated they would like to get it annually and 2 indicated they would prefer to receive the HECR twice a year. Of the quarterly HECR customers that would prefer to get the HECR more frequently, seven indicated they would like to get it monthly and five indicated they would prefer to receive the HECR every other month.

Three of the six customers who indicated that they do not read the HECR receive the report monthly, and all of them would like to continue to receive it at the same frequency. One indicated they would like to receive a HECR only when there is a significant change in their energy consumption.

Of the three quarterly HECR customers that do not read the HECR, one does not want to receive them at all, and the other two are fine with receiving the HECR quarterly.

Tips and Messages

The series of questions regarding recalled tips and message that were asked of surveyed HECR customers can be found in Appendix B: HECR Customer Survey Instrument starting on page 43, and begin with question 9. First we asked if they recalled any of the tips that they read on the HECR, and if they did, we asked which tips they recalled. For all recalled tips and messages (up

to four¹¹), we asked a series of questions about those tips or messages they recalled. We asked if their response to the tip or message was favorable, if it was believable, if and what they did in response to the tip or message, and how influential the HECR was in their decision to take the action.

Duke Energy provided TecMarket Works with an example of each HECR mailing, and the database of customer contacts provided to TecMarket Works included which HECR mailings customers received and when (by the mail drop date provided). With this information, we determined if the message or tip they recalled was a correct or false recollection of a tip or message they received. If the recalled tip or message was correct, we calculated how many days passed from the day they received the HECR with that tip or message to the day that they were surveyed by TecMarket Works.

If a message or tip was sent to a customer on multiple HECRs, then the days to recall - or days from receiving the HECR mailing with that HECR message or tip to the day the customer was surveyed - is from the last HECR mailing with that message. For example, if the customer received a furnace filter tip on a report with a mail drop date of September 29, 2010 and again received a furnace filter tip with a mail drop date of October 28, 2010, and then was surveyed on February 8, 2011, we count the number of days from the October drop date for the "days to recall" metric, which would be 103 days in this example (instead of 132).

The Difference Between Tips and Messages

Duke Energy staff provided a key to what energy efficiency statements were tips and which were messages. The key can be found in Appendix I: Summary of Tips and Messages. In summary, the difference was the location of the statements on the HECR. Examples of the HECR provided to TecMarket Works can be found in Appendix J: All Examples of All HECR Mailings.

Recalled Tips and Messages

Surveyed HECR customers that read the HECR were asked if they recalled any of the tips or messages on any of the HECRs they received. Table 11 presents a summary of how many surveyed HECR customers recalled tips or messages. The top row of the table presents the number of customers recalling tips or messages in each of the four groups, with the percent of each group in the second row.

The bottom four rows in Table 11 present the same metrics as the top 4 rows, but only consider tips and messages that were correctly recalled. There were very few surveyed HECR customers (n=18, or 7.0%) that incorrectly recalled a tip or message. A higher percentage of HECR customers are correctly recalling tips or messages if they receive the monthly version of the HECR. The average number of tips or messages recalled is slightly higher for the monthly HECR recipients. Table 11 presents the mean number of tips or messages recalled for the full group of surveyed HECR customers that read the HECR, and the mean for those surveyed customers who recalled at least one tip or message. For those that recall at least one tip or message, the mean number of tips or messages recalled by Index Table HECR recipients is 1.27

¹¹ Only three customers recalled four tips, all others recalled 0-3 tips or messages.

for those receiving the HECR monthly, and 1.38 for those receiving the Line Graph HECR monthly.

Table 11. Summary of Number of Tips and Messages Recalled

	Monthly		Quarterly	
	Index (n=64)	Line (n=64)	Index (n=62)	Line (n=66)
Count of Customers Indicating They Recalled Tips or Messages	33	21	12	32
Percent of Customers Indicating They Recalled Tips or Messages	51.6%	32.8%	19.4%	48.5%
Mean Number of Tips or Messages Recalled (maximum of 4), All Surveyed	0.80	0.47	0.35	0.85
Mean Number of Tips or Messages Recalled (maximum of 4), All Surveyed With At Least One Recalled Tip or Message	1.55	1.43	1.83	1.75
The Values Below Consider Only Correctly Recalled Tips and Messages				
Count of Customers Recalling At Least One Tip or Message Correctly	30	16	10	24
Percent of Customers Recalling At Least One Tip or Message Correctly	46.9%	25.0%	16.1%	36.4%
Mean Number of Correctly Recalled Tips or Messages (maximum of 4), All Surveyed	0.59	0.34	0.18	0.45
Mean Number of Correctly Recalled Tips or Messages (maximum of 4), All Surveyed With At Least One Correctly Recalled Tip or Message	1.27	1.38	1.10	1.25

Tips and messages that were excluded from this analysis are as follows:

- Buy EE appliances (N=4)
- Do laundry at night
- Fix faucet drips
- Install EE windows & doors (N=2)
- Insulate water heater
- Insulation (N=8)
- Layering clothes (N=2)
- Lower water heater temperature (N=5)
- Power strip
- Replace old AC units
- Take shorter showers (N=2)
- Turn lights off (N=12)
- Turn off electronics (N=2)
- Use passive solar heating
- Wash with cold water (N=2)
- Weather stripping (N=7)
- Wrap hot water pipes

Comparison: Messages versus Tips

The primary difference between a tip and a message is the location of the statement on the HECR. For a complete list of messages and tips included in this analysis, please see Appendix I: Summary of Tips and Messages. Table 12 presents the mean number of tips and messages recalled by HECR group, and the mean number of days to recall that tip or message.

The surveyed Index Table Monthly HECR customers were more likely to recall tips over messages, but the opposite is true for other groups, who recalled messages more frequently. The tips cover a variety of topics such as limiting time that their refrigerator door is open, dressing for the weather, installing programmable thermostats, etc. Recalled messages were almost all about CFLs, which is arguably the most expected answer. Almost all of the messages recalled (55 out of 59, or 93.2%) are about CFLs, and statements about CFLs was a message that was repeated over multiple HECR mailings for many customers. This could help explain why the days to recall is much lower for messages than tips. As explained above, when messages (or tips) were repeated on multiple HECR mailings, we used the most recent HECR drop date for calculating Days to Recall.

Table 12. Number of Correctly Recalled Tips and Messages

	Monthly		Quarterly	
	Index (n=30)	Line (n=16)	Index (n=10)	Line (n=24)
Number of Correctly Recalled Tips	23	7	4	9
Mean Number of Tips per Customer	0.77	0.44	0.40	0.38
Number of Correctly Recalled Messages	15	15	7	21
Mean Number of Messages per Customer	0.50	0.94	0.70	0.88
Mean Days of Recall: Tips	106	95	94	160
Mean Days of Recall: Messages	58	69	51	42

The tables below present all of the correctly recalled tips and messages¹² (note that most are tips, so only messages are noted in the first column and are at the bottom of the list for each table), the number of surveyed customers recalling the tip or message, how many of them responded to the tip or message favorably, how many found it believable, and finally, how many of them took action based on the tip or message along with the influence of the HECR on their taking the action. The Influence Score was determined by calculating the mean response to the following: *"Please indicate how influential the Home Energy Comparison Report was to your decision to take this action using a 1 to 10 scale with 1 meaning the report had no influence and you would have taken this action on your own, and 10 meaning that the report was very influential and that you would not have taken this action on your own without reading the tip on the Report."*

For surveyed HECR customers that receive the Monthly Index report, the most commonly recalled tips were to adjust the water heater temperature (n=8), and seal drafts (n=6). Of these two, the water heater tip resonated most favorably with customers with a score of 9.0 out of 10, and all 8 of them found the tip believable and took action in response to the tip. HECR's influence on their action was given a score of 7.7 out of 10.

¹² Tips are presented alphabetically for easy reference and comparison between the four groups. Recalled messages are at the bottom of each of the tables.

Table 13. Recalled Tips and Messages: Monthly Index, n=30 Surveyed Customers

Recalled Message or Tip	Number of Recalls for This Tip or Message	Mean Favorability Score	Number Finding It Believable	Number of Customers Taking Action	Mean Influence Score of HECR on Action
Furnace filter	1	7.0	1	1	8.0
Lower Thermostat	3	9.0	3	3	3.3
Power strip	1	10.0	3	1	9.0
Programmable thermostat	2	8.0	2	1	1.0
Seal	6	8.8	6	6	6.8
Water Heater	8	9.0	8	8	7.7
Message: CFLs	15	7.6	14	14	4.0

There were fewer Monthly Line customers recalling messages and/or tips (n=16 out of 64, or 25%). Their recalled tips and messages are presented below in Table 14. Most commonly recalled was the message about CFLs, with 11 customers recalling it with a mean favorability score of 7.9. All surveyed customers said they took action in response to this message. Tips were not recalled by many, with each recalled tip being recalled by only one surveyed customer in this group. However, all the favorability scores provided for the tips were high, and everyone found the tips believable and many took action based on the HECR tips provided.

Table 14. Recalled Tips and Messages: Monthly Line, n=16 Surveyed Customers

Recalled Message or Tip	Number of Recalls for This Tip or Message	Mean Favorability Score	Number Finding It Believable	Number of Customers Taking Action	Mean Influence Score of HECR on Action
EE Windows	1	7.0	1	0	-
Fix leak	1	8.0	1	1	9.0
Furnace filter	1	9.0	1	1	-
insulated dishes	1	10.0	1	0	-
Programmable thermostat	1	8.0	1	1	8.0
Turn off electronics	1	8.0	1	1	8.0
Water Heater	1	6.0	1	0	-
Message: CFLs	11	7.9	11	7	8.1
Message: Lower Thermostat	1	9.0	1	1	8.0
Message: Programmable Thermostat	1	10.0	1	1	2.0
Message: Seal	2	7.0	2	0	-

Customers that receive the HECR on a quarterly basis responded favorably to the tips and message and took action influenced to some degree by the HECR, particularly to the CFL message. However, very few messages or tips were recalled by this group, with only 10 out of 62 (16%) recalling the 11 tips and messages recalled. For every tip and message recalled, all the

surveyed customers took action based on the HECR tip and messages, with high HECR Influence scores.

Table 15. Recalled Tips and Messages: Quarterly Index, n=10 Surveyed Customers

Recalled Message or Tip	Number of Recalls for This Tip or Message	Mean Favorability Score	Number Finding It Believable	Number of Customers Taking Action	Mean Influence Score of HECR on Action
Lower thermostat	3	8.3	2	3	10.0
Pause at fridge	1	8.0	1	1	10.0
Message: CFLs	7	8.9	6	7	6.7

Quarterly Line customers are similar to the Quarterly Index customers in their recall of messages and tips with CFLs and lowering the thermostat being the most commonly recalled.

Table 16. Recalled Tips and Messages: Quarterly Line, n=24 Surveyed Customers

Recalled Message or Tip	Number of Recalls for This Tip or Message	Mean Favorability Score	Number Finding It Believable	Number of Customers Taking Action	Mean Influence Score of HECR on Action
Lower thermostat	3	8.3	3	2	8.0
Pause at fridge	1	9.0	1	1	8.0
Printer	1	10.0	1	1	10.0
Programmable thermostat	4	8.8	4	3	9.0
Message: CFLs	21	8.8	20	20	6.8

Table 17 presents all the above recalled tips and messages in one table, combining all counts and averaging the favorability and influence scores of all responses for each tip or message. The CFL message was recalled by 54 surveyed customers (out of 80 recalling tips and messages, 67.5%), with 49 of them taking action in response to this tip (90.7%) with a mean influence score of 6.2 out of 10, indicating that the HECR did, to some degree, influence their actions. Many of these customers said that they called Duke Energy to get the coupons for CFLs and are replacing some or all of their bulbs with CFLs, or in the process of transitioning to all CFLs.

Table 17. All Recalled Tips and Messages

Recalled Message or Tip	Number of Recalls for This Tip or Message	Mean Favorability Score	Number Finding It Believable	Number of Customers Taking Action	Mean Influence Score of HECR on Action
EE Windows	1	7.0	1	0	-
Fix leak	1	8.0	1	1	9.0
Furnace filter	2	8.0	2	2	8.0
Insulated dishes	1	10.0	1	0	-
Lower Thermostat	10	8.6	9	9	5.3
Pause at fridge	3	8.3	3	2	9.0
Printer	1	10.0	1	1	10.0

Power strip	1	10.0	3	1	9.0
Programmable thermostat	7	8.4	7	5	6.0
Seal	7	8.6	7	6	6.8
Turn off electronics	1	8.0	1	1	8.0
Water Heater	8	8.5	7	7	7.3
Message: CFLs	54	8.3	49	48	6.2
Message: Lower Thermostat	1	9.0	1	1	8.0
Message: Programmable Thermostat	1	10.0	1	1	2.0
Message: Seal	2	7.0	2	0	-

The tips and messages were received by HECR customers at varying times, with some tips and messages being repeated. The "days to recall" metric is one that is presented here so that readers can determine the "staying power" of certain tips and messages by comparing their recall rates, favorability and influence with the days to recall presented in Figure 3. The drop dates of the messages and tips as presented in Appendix I: Summary of Tips and Messages. The tips and messages with the lowest mean number of days to recall were all tips and messages that were sent within the previous few months of the survey. However, many of the tips and messages have a very long gap from being presented in a HECR to the time the customer was surveyed.

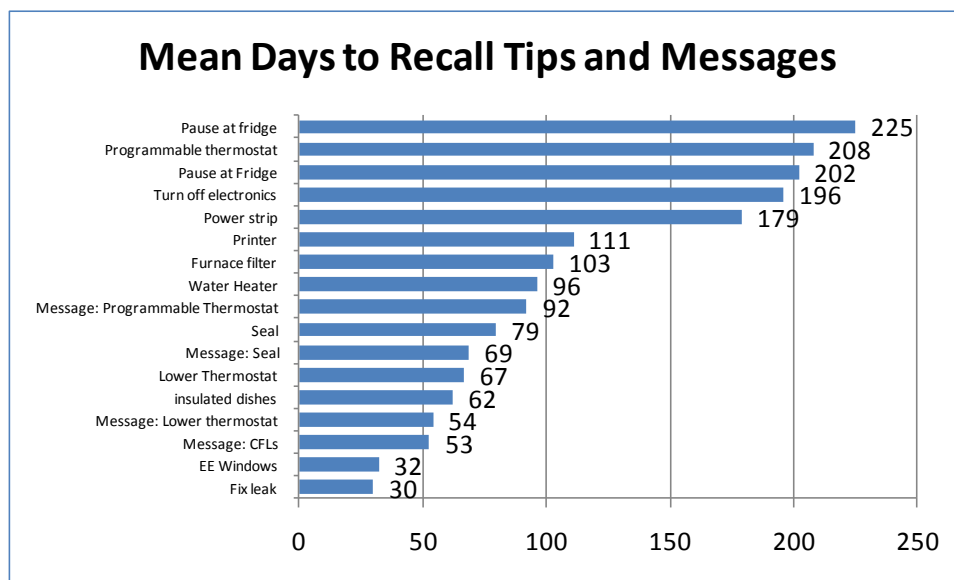


Figure 3. Mean Days to Recall Tips and Messages, All Groups

Tip and Message Relevance

Almost all (89 out of 98, or 90.8%) of the surveyed HECR customers that correctly or incorrectly recalled tips or messages felt that the tips and messages included on the HECR were relevant and

applied to them and to their household. Two said they didn't feel the tips and messages were relevant and provided the following comments about their relevance.

- "Turn off electronics."
- "Window insulation/replacement - I would like to, but can't afford to make improvements."

Other Energy Efficiency Actions Taken

Many of the surveyed HECR customers have taken actions since January of 2010 (when they started receiving the HECR mailing) that they say were not influenced by the HECR messages or tips. Table 18 presents the number and percent of surveyed customers who have reported that they have taken energy efficient actions. If the customer indicated that they took action, we asked them what they did. These open-ended responses are in Appendix K: List of Self-Reported Energy Efficiency Actions. The first question was open-ended and contains a variety of responses. The series of questions following the first asked about specific changes that they may have made in their homes. While there are some differences between those that read HECR and those that do not, please keep in mind that there were only 6 surveys with people that do not read the HECR.

Table 18. Energy Efficiency Actions Taken by Customers

	Read HECR (N=257)		Throw Away HECR (n=6)	
	N	Percent	N	Percent
Has Taken Energy Efficiency Action	94	36.6%	1	16.7%
Has Replaced Appliances	75	29.2%	1	16.7%
Changes Affecting Cooling of Home	83	32.3%	0	-
Changes Affecting Heating of Home	97	37.7%	1	16.7%
Changes Affecting Lighting of Home	177	68.9%	4	66.7%
Changes Affecting Electronics or Computers	60	23.3%	1	16.7%
Changes Affecting Hot Water Heating	54	21.0%	2	33.3%
Has a Swimming Pool or Spa	30	11.7%	1	16.7%
Changes Affecting Pool or Spa	13	5.1%	0	-

Satisfaction with HECR

Customers who indicated that they read the HECR (n=257) provided their satisfaction with various aspects of the HECR. Their satisfaction is presented in this section.

Surveyed HECR customers that read the HECR were asked to indicate their agreement with a series of statements using a scale of 1-10, with 1 indicating that they strongly disagreed with the statement, and 10 indicating that they strongly agreed with the statement. A summary of the results are presented in Table 19.

The highest levels of satisfaction across the four groups are bolded in Table 19 below. Overall scores are high, with the most satisfaction with the reports being easy to read and understand, and with the graphics being helpful to them in understanding how their energy usage changes over the seasons.

Table 19. Mean Satisfaction with HECR

Statement	Monthly		Quarterly		Overall
	Index (n=64)	Line (n=64)	Index (n=62)	Line (n=66)	
The reports are easy to read and understand.	9.23	9.21	9.48	9.0	9.23
The energy saving tips in the report provided new ideas that I was not previously considering.	6.89	7.38	7.0	7.0	7.06
I find the reports useful.	8.20	8.16	8.44	8.35	8.29
I enjoy receiving and reading the reports.	8.19	8.16	8.48	8.32	8.29
I find the graphics helpful in understanding how my energy usage compares to others like me.	8.55	8.75	8.50	8.72	8.63
I find the graphics helpful in understanding how my energy usage changes over the seasons.	NA ¹³	8.92	NA	8.85	8.88
Overall I am satisfied with the reports.	8.86	8.74	8.87	9.0	8.87

Many of the surveyed HECR customers are sharing or discussing their reports with others. If they indicated that they did share or discuss their HECR with others, we asked with whom they shared or discussed it. Table 20 presents the percent of customers sharing or discussing their HECR by HECR type and frequency with the overall percentage presented in the last column. Almost half (45.7%) of the surveyed customers shared or discussed the HECR with their families. Another 14.1% shared or discussed their reports with others outside their families, such as co-workers, neighbors, and/or friends.

Table 20. Percent of HECR Customers Sharing Their Reports with Others

	Monthly		Quarterly		Overall
	Index (n=64)	Line (n=64)	Index (n=62)	Line (n=66)	
Percent discussing their HECR with others in their household.	50.0%	48.4%	40.3%	42.4%	45.7%
Percent discussing their HECR with others outside of their household.	21.9%	10.9%	8.1%	15.2%	14.1%

Energy Efficiency Scores

We asked surveyed customers that read the HECR how useful they found the Home Energy Comparison Score on a 1 to 10 scale with 1 meaning "Not At All Useful" and 10 meaning "Very Useful". We also asked them if their score had gotten better (decreased score), stayed the same, or gotten worse (increased score), and if they were trying to improve their score.

¹³ This statement was read only to HECR customers that receive the Line Graph version of the report, as it does not apply to those that get the Index Table version.

Table 21 below presents the number and percentage of surveyed HECR customers that think their score is getting better, worse, or staying the same. Most believe that it's getting better (34%) or staying the same (42%), and about 16% don't know how it's changed.

Table 21. HECR Customer Self-Reported Score Changes

	Monthly		Quarterly		Overall (n=253)
	Index (n=64)	Line (n=63)	Index (n=62)	Line (n=64)	
Think Their Score Is Improving	27	19	20	21	87
Percent	42.2%	30.2%	32.3%	32.8%	34.4%
Think Their Score Is Staying the Same	28	31	25	21	105
Percent	43.8%	49.2%	40.3%	32.8%	41.5%
Think Their Score Is Getting Worse	7	2	9	2	20
Percent	10.9%	3.2%	14.5%	3.1%	7.9%
Don't Know How Their Score Changed	2	11	8	20	41
Percent	3.1%	17.7%	12.9%	31.3%	16.2%

Those that think their score is improving find the HECR score the most useful with a mean score of 8.6 on a 10-point scale, which is more than a full point higher than those that think their score is staying the same, getting worse, or those that don't know how their score has changed.

Table 22. Usefulness of the HECR Score

	Monthly		Quarterly		Overall
	Index (n=64)	Line (n=64)	Index (n=62)	Line (n=66)	
Think Their Score Is Improving	8.2	8.5	8.5	9.2	8.6
Think Their Score Is Staying the Same	6.1	7.0	7.3	7.3	6.9
Think Their Score Is Getting Worse	5.7	7.5	8.0	7.5	7.1
Don't Know How Their Score Changed	8.0	7.1	6.0	6.9	6.9
Overall	7.0	7.5	7.6	7.9	7.5

Table 23 below shows that those that think their score is improving are also the most likely to try to improve their score.

Table 23. Percent of HECR Customers Trying to Improve Their Score

	Monthly		Quarterly		Overall
	Index (n=64)	Line (n=64)	Index (n=62)	Line (n=66)	
Think Their Score Is Improving	93.2%	84.2%	85.0%	85.7%	88.1%
Think Their Score Is Staying the Same	60.7%	77.4%	72.0%	57.1%	67.6%
Think Their Score Is Getting Worse	85.7%	100.0%	66.7%	100.0%	80.0%
Don't Know How Their Score Changed	100.0%	72.7%	62.5%	85.0%	78.0%
Overall	79.7%	79.4%	74.2%	76.6%	77.2%

Accuracy of Home Information

About 54% of the HECRs sent to the surveyed customers report that their home information is correct on their HECR. About a third of them do not know. This could be because they don't know the age or size of their home¹⁴, or because they don't look at the house data on their HECR.

Table 24. Accuracy of Home Information

	Monthly		Quarterly		Overall
	Index (n=64)	Line (n=63)	Index (n=62)	Line (n=64)	
Percent Correct	45.3%	54.0%	58.1%	57.8%	53.8%
Percent Incorrect	20.3%	14.3%	16.1%	9.4%	15.0%
Don't Know	34.4%	31.7%	25.8%	32.8%	31.2%

About 14% of the surveyed HECR customers report that there is incorrect information on their mailings. The following comments were provided by the surveyed HECR customers about what is incorrect on their HECR.

House Size: (N = 26)

- "My home's size is 2500 sq. ft. - report says it's smaller."
- "Home is 2300 sq ft, not 2150."
- "Home is smaller than the report claimed - he called Duke to correct it."
- "Home size was lower than indicated."
- "House is a bit smaller than the report says (actually 1,580 sq. ft.)."
- "House is actually 1300 sq. ft. - not 1700."
- "House is actually 3,000 sq.ft. - report lists it much smaller. I tried to correct it via the website twice with no result."
- "House is actually 3,200 sq. ft.."
- "House is actually 4,000 sq.ft. - report said it's much smaller."
- "House is actually 5,000 sq.ft. - report said 2,600 sq. ft.."
- "House is actually 6,500 sq.ft. - report had it much smaller."
- "House is much smaller than report indicates."
- "House is now 3,000 sq. ft. after recent addition - report said much smaller"
- "Report has her size too large - it's actually 1400 sq.ft."
- "Size is wrong is 2800 not 1900."
- "Size is wrong, too small."
- "Size of home was too small."
- "Size should be 3200 sq.ft. - report had it smaller."
- "Square footage is 4400, but Duke compares it to homes in the 1800-2000 sq.ft. range."
- "Square footage is wrong. The house is about 3,000 square but is listed at 1,700."
- "Square footage wrong on first report; customer called Duke, and second report was correct."
- "Square footage, the correct footage is 2400 ft."

¹⁴ We asked what the size of the heated area of their home is at the end of the survey, and of the 79 customers indicating "don't know" to this question regarding HECR accuracy, 13.9% (n=11) of them responded "don't know" when we asked about the size of their home later in the survey.

- "The size is incorrect."
- "The square footage has changed due to addition of sunroom."
- The square footage is too high
- The square footage is wrong (4500 square feet, not 1700). Home built in 1986.

Age of Home: (N = 7)

- "16 years old, not 24."
- "Age of house is closer to 35 years."
- "Age: built in 1992, report says 1983."
- "Built in 1970s not 1980s."
- "My home is only four years old."
- "House was built in 1985 - report says 1989-99."
- "The age is wrong (says 1970s), actually built in late 1940s."

House Size and Age of Home: (N = 4)

- "House is actually 2,700 sq.ft. & 14 years old."
- "House is actually 4600 sq. ft. - report said much smaller; built in 2000."
- "House was actually built in 1978; house is 4000 sq. ft. not 2300."
- "Size and age are wrong - 1974 not 1980's, and 2400 sq. ft. not 700-2300."

Customer-Suggested Changes to the HECR

About 17% of the surveyed HECR customers that read the HECR had suggestions for changes to the HECR. Those that read the survey gave many suggestions for changes they would like to see made to the HECR, and this complete list can be found in Appendix G: Changes Surveyed HECR Customers Would Like to See, by Group. The suggestions vary, but there were four categories of statements that stood out:

1. **Online Functionality** (n=6), such as:
 - a. Having the report sent via email and/or available on online
 - b. Duke should provide a chat room or conference calls for customers to discuss efficiency issues.
 - c. Having a website to visit with more tips and links
2. **HECR Design** (n=4), such as:
 - a. Having it easier to read, especially for older customers
 - b. Spanish language version
3. **Comparison to Other Homes** (n=17), such as:
 - a. Having the home info correct is important, such as the size and age of home
 - b. HECR should take more factors into account, such as pools and family size
 - c. Compare multiple years with line graph
4. **Tip Suggestions** (n=6), such as:
 - a. New ideas & trends

- b. Tips that are more specific to each customer
- c. More free or low-cost tips

Table 25. Customers That Would Like Changes Made to the HECR

	Monthly		Quarterly		Overall
	Index (n=64)	Line (n=64)	Index (n=62)	Line (n=66)	
Customers that read the HECR and would like to see changes to the HECR	26.6%	14.1%	16.1%	12.5%	17.3%
Customers that throw away the HECR and would like to see changes to the HECR	-	33.3%	33.3%	-	33.3%

The two surveyed customers that do not read the HECR and would like changes to be made had the following comments.

- "Get my house size correct."
- "The report should use accurate home information. (I filled out a survey 5 years ago - send me a new questionnaire)."

Additional Services from Duke Energy

TecMarket Works asked surveyed HECR customers (those that read it and those that throw the HECR away, n=262) about their interest in a list of additional services that Duke Energy may offer. TecMarket Works read the following statement: *"As a follow up to the report, Duke Energy is interested in providing further services that might be of interest to customers. I am going to read a list of possible services that Duke Energy may consider offering. On a scale from 1-10, with 1 indicating that you would be very uninterested, and 10 indicating that you would be very interested agree, please rate your interest in the following services."*

A summary of the responses is presented in Table 26 below. Surveyed HECR customers have the most interest in rebates for energy efficient home improvements and in home energy audits, which are provided through Duke Energy's Smart Saver[®] and Home Energy House Call[®] programs, respectively. While many indicated that they would like help in finding energy efficient equipment and appliances, there was very low interest (2.61 on a 10-point scale) in social networking sites set up by Duke Energy to read about or discuss energy efficient solutions with energy experts. There was not a follow up question asking customers how they would like to receive this information if they indicated they were interested in getting help, but since many read the HECR, directions to finding this kind of information could be included in a HECR mailing.

Table 26. Interest in Additional Duke Energy Services

	Monthly		Quarterly		Overall (n=262)
	Read (n=127)	Throw Away (n=3)	Read (n=126)	Throw Away (n=3)	
Help in finding weatherization	4.01	1.67	4.44	2.33	4.17

TecMarket Works**Evaluation Findings**

contractors to make your home more efficient					
Help in finding energy efficient equipment and appliances	5.13	2.33	5.33	5.00	5.19
Rebates for energy efficient home improvements	7.52	4.67	7.49	8.33	7.48
Inspection services of work performed by contractors	4.74	3.67	5.22	3.67	4.95
Financing for energy efficient home improvements	4.69	3.33	5.10	4.33	4.87
Home energy audits or inspections of your home with specific recommendations for improvements	5.50	3.33	5.71	5.50	5.57
Social Networking sites such as Facebook and Twitter to read about or discuss energy efficient solutions with energy experts.	2.71	2.33	5.55	1.33	2.61

Conclusions and Recommendations for Program Changes

The Home Energy Comparison Report provides Duke Energy residential customers with a meaningful comparison of their home's energy use compared to other homes similar to their own.

TecMarket Works presents the following recommendations for program changes.

1. Duke Energy should consider setting up test groups that receive the same HECR type with the same tips and messages. Of the surveyed customers, only a few of them received the same HECR mailings containing the same tips and messages. With a specific set of test groups of customers receiving the same mailings with identical tips and messages, a more thorough and meaningful analysis of which tips and messages are recalled and acted upon could be performed.
2. Add CFL coupons to the HECR mailing if it can be shown that the participants can use additional CFLs that they are not likely to purchase on their own. Customers that use the coupons will show that they are reading the HECR and are open to the messages and tips, and possibly to solicitations for participation in other Duke Energy programs. The number of redeemed coupons can also be utilized in the billing analysis and allow for engineering estimates of energy savings.

Impact Analysis

The results of the impact evaluation of the monthly HECR report are presented in Table 27. While the estimated model included weather terms and monthly indicator variables, these are omitted to highlight the estimate impact of the program.

Table 27. Estimated Savings Model – dependent variable is daily usage kWh, Jan. 2009 to June 2011 (savings are negative)

Independent Variable	Coefficient (kWh/day)	t-value
Treatment	-0.403	-5.59
Sample Size	1,029,012 observations (35,248 homes)	
R-Squared	74%	

This estimated model shows that the HECR program results in an average annual savings of 0.403 kWh/day or 147 kWh/year. This estimate is statistically significant at the 95% confidence level. The estimated models, both overall and by customer usage level, are presented in Appendix L: Estimated Billing Data Models.

Note that it was not possible to determine the kW impacts of the program since consumption data is only available at the monthly (kWh) level. kW impact estimates of savings are made outside of the billing analysis efforts and are projected using DSMore kW impact estimates based on the degree of kWh savings.

Appendix A: Program Manager Interview Instrument

Name: _____

Title: _____

Position description and general responsibilities:

We are conducting this interview to obtain your opinions about and experiences with the Home Energy Comparison Report Program. We'll talk about the Program and its objectives, your thoughts on improving the program and its participation rates, and the technologies the program covers. The interview will take about an hour to complete. May we begin?

Program Objectives

1. In your own words, please describe the Home Energy Comparison Report Program's objectives.
2. In your opinion, which objectives do you think are being met or will be met? How do you think the program's objectives have changed over time?
3. Are there any program objectives that are not being addressed or that you think should have more attention focused on them? If yes, which ones? How should these objectives be addressed? What should be changed? Do you think these changes will increase program participation?
4. Should the program objectives be changed in any way because of market conditions, other external or internal program influences, or any other conditions that have developed since the program objectives were devised? What changes would you put into place, and how would it affect the objectives?
5. What kinds of marketing, outreach and customer contact approaches do you use to make your customers aware of the program and its options? Are there any changes to the program marketing that you think would increase participation?

6. Are there any changes to the incentives or marketing that could possibly increase participation in the program?

Overall HECR Management

7. Describe the use of any advisors, technical groups or organizations that have in the past or are currently helping you think through the program's approach or methods. How often do you use these resources? What do you use them for?
8. Overall, what about the Home Energy Comparison Report Program works well and why?
9. What doesn't work well and why? Do you think this discourages participation?
10. If you had a magic wand and could change any part of the program what would you change and why?

Program Design & Implementation

11. What market information, research or market assessments are you using to determine the best target markets or market segments to focus on?
12. What market information, research or market assessments are you using to identify market barriers, and develop more effective delivery mechanisms?
13. How do you manage and monitor or evaluate contractor involvement or performance? What is the quality control and tracking process? What do you do if contractor performance is exemplary or below expectations?
14. In your opinion, did the incentives cover enough different kinds of energy efficient products?

1. ☐ Yes 2. ☐ No 99. ☐ DK/NS

If no, 14b. What other products or equipment should be included? Why?

15. In what ways can the Home Energy Comparison Report Program's operations be improved?
16. Do you have any suggestions for how program participation can be increased?

Appendix B: HECR Customer Survey Instrument

The questions below require mostly short, scaled replies from the interviewee, and not all questions will be asked of all participants.

Home Energy Comparison Report Program

Participant Survey

Use five attempts at different times of the day and different days before dropping from contact list. Call times are from 10:00 a.m. to 8:00 p.m. EST or 9-7 CST Monday through Saturday. No calls on Sunday. (Sample sizes: OH=250, SC=250)

SURVEY

Note: Only read words in bold type.

Hello, my name is _____. I am calling on behalf of Duke Energy to conduct a customer survey. May I speak with _____ please?

If person talking, proceed. If person is called to the phone reintroduce.

If not home, ask when would be a good time to call and schedule the call-back:

Call back 1:	Date: _____,	Time: _____	<input type="checkbox"/> AM or <input type="checkbox"/> PM
Call back 2:	Date: _____,	Time: _____	<input type="checkbox"/> AM or <input type="checkbox"/> PM
Call back 3:	Date: _____,	Time: _____	<input type="checkbox"/> AM or <input type="checkbox"/> PM
Call back 4:	Date: _____,	Time: _____	<input type="checkbox"/> AM or <input type="checkbox"/> PM
Call back 5:	Date: _____,	Time: _____	<input type="checkbox"/> AM or <input type="checkbox"/> PM

☐ Contact dropped after fifth attempt.

We are conducting this survey to obtain your opinions about the Home Energy Comparison Report. Duke Energy's records indicate that you have been receiving the Home Energy Comparison Report in the mail. We are not selling anything. Your answers will be confidential, and will help us to make improvements to the report to better serve others. May we begin the survey?

Note: If this is not a good time, ask if there is a better time to schedule a callback.

1. Do you remember receiving the Home Energy Comparison Reports in the mail from Duke Energy since <date of first mailing>?

1. <input type="checkbox"/> Yes, begin	→	Skip to Q3.
2. <input type="checkbox"/> No,	↓	
99. <input type="checkbox"/> DK/NS		

This program provided information on how much electricity you used in the previous month and in the previous 12 months compared to your neighbors and provided tips on how you could lower your electricity use and costs in becoming more energy efficient.

Do you remember receiving these reports now?

1. ☐ Yes, *begin* → *Go to Q2.*
2. ☐ No, ↓
99. ☐ DK/NS ↓

If No or DK/NS terminate interview and go to next participant.

Great, I'd like to continue this survey with you. The survey will take 10-20 minutes. At the end I would like to verify your address so we can send you \$10 for your time on the phone with me today. May we continue?

2. What do you do with the Home Energy Comparison Report when you receive it?

- a. ☐ I read it
b. ☐ Someone else in the house reads it - *can I talk to that person?*
Schedule callback if necessary.
c. ☐ Threw it away/ignored it
d. ☐ Other: _____

If a: 2a. Why do you read the Home Energy Comparison Report?

- a. ☐ It is from Duke Energy
b. ☐ I am interested in learning more about how to save energy
c. ☐ I am interested in learning more about climate change or environmental reasons
d. ☐ Avoid increases in power costs or lower rates
e. ☐ Other: _____
f. ☐ Don't Know

If c: 2b. Why do you throw it away or ignore it?

- a. ☐ I'm too busy/don't have time
b. ☐ It's too confusing
c. ☐ I don't believe it's accurate for my household
d. ☐ I've done all the tips it suggests
e. ☐ I'm already doing the best that I can

- f. ☐ I do not care about energy savings or use
- g. ☐ Too low a priority for me
- h. ☐ Other: _____
- i. ☐ Don't Know

2c. Did you always ignore the report, or did you read some but have since stopped?

- a. ☐ Never read them
- b. ☐ I read some – About how many did you read? _____
- c. ☐ Don't Know

3. When you consider the efforts you and your household make to decrease your energy consumption at your home, do you feel that on average your efforts are less than what others typically do, about the same as what others typically do, or more than what others typically do?

- a. ☐ Less than others
- b. ☐ About the same
- c. ☐ More than others
- d. ☐ Don't Know

4. In your own words, please tell me what it means to be energy efficient.

5. When you think about what you and your household does or can do to decrease energy consumption, what things come to mind?

- a. ☐ _____ Anything else?
- b. ☐ _____ Anything else? (repeat until exhausted)
- c. ☐ Don't Know

6. Using a 1 to 10 scale with 1 meaning “very uninterested” and 10 meaning “very interested”, what is your level of interest in saving energy in your home?

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

7. Using the same 1 to 10 scale with 1 meaning “very uninterested” and 10 meaning “very interested”, what is your level of interest in reading your next report?

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

8. Would you like to receive these reports more frequently, less frequently, or at the same frequency they are now being sent to you?

- a. ☐ More frequently
- b. ☐ Less frequently
- c. ☐ Same frequency
- d. ☐ Don't want to get any
- e. ☐ Don't Know

If 8 is a or b, 8a: How often would you prefer to get the reports?

- a. ☐ Daily
- b. ☐ Weekly
- c. ☐ Monthly
- d. ☐ Every other month
- e. ☐ Few times a year/quarterly
- f. ☐ Annually
- g. ☐ Other: _____
- h. ☐ Don't Know

8b. Would you prefer to get the reports electronically through email?

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

If they did not read the reports, Skip to question 16.

9. You received multiple tips on how to save energy on the Home Energy Comparison Reports. Do you recall what any of the tips were?

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

If yes, 9a. What tips do you remember?

- ☐ _____ Anything else?
- ☐ _____ Anything else?
- ☐ _____ Anything else?

9b. Using a 1 to 10 scale with 1 meaning your reaction to this tip was very unfavorable and 10 meaning your reaction was very favorable, please tell me about your reaction to this tip.

1 2 3 4 5 6 7 8 9 10

☐ Don't Know ☐ Don't Remember

9c. Did you feel that this tip was believable, that is, that it could help you reduce your energy consumption?

☐ Yes ☐ No ☐ Don't Know

If no, 9d.

What about it was not believable?

9e. Did you do anything to your home/behavior in response to this tip?

☐ Yes ☐ No ☐ Don't Know ☐ Maybe

If yes, 9f. What did you do?

If no, 9g. Do you plan to do anything in response to this tip?

☐ Yes ☐ No ☐ Don't Know ☐ Maybe

If yes, 9h. When? _____

10. Please indicate how influential the Home Energy Comparison Report was to your decision to take this action using a 1 to 10 scale with 1 meaning the report had no influence and you would have taken this action on your own, and 10 meaning that the report was very influential and that you would not have taken this action on your own without reading the tip on the Report.

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

Repeat 9b-h and 10 for all recalled tips.

11. Did you feel that the tips included on the report were relevant and applied to you and your household?

☐ Yes ☐ No ☐ Don't Know

If no, 11a. Do any specific tips stand out to you as not applying to you or your house?

☐ _____ Any others?
☐ _____ Any others?
☐ _____ Any others?

12. The report presented a comparison of your home energy usage to that of similar homes. Using a 1 to 10 scale with 1 meaning this comparison was not at all useful and 10 meaning it was very useful, how useful was this comparison?

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

13. The Report provided you with a home energy efficiency score. Has your efficiency score gotten better, worse, or stayed the same since you first started receiving the report in <first report month>?

- a. ☐ Better (Decreased Score)
- b. ☐ Worse (Increased Score)
- c. ☐ Stayed the same
- d. ☐ Don't Know

14. Are you trying to improve your home efficiency score?

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

For all actions indicated in response to question 9..

15. Are the characteristics such as your home size and age correct on your report?

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

If No, 15a. What is incorrect?

16. Since January 2010, have you done anything else to save electricity in your home that was not included as a tip contained in the Home Energy Comparison Reports?

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

If yes, 16a. What have you done?

- ☐ _____ *Get details.*
Anything else?
☐ _____ *Get details.*
Anything else?
☐ _____ *Get details.*
Anything else?
- ☐ Don't Know

17. Have you done anything with the appliances in your home to save energy, such as removed second refrigerators or replaced old units?

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

If yes, 17a. What have you done?

- ☐ _____ *Get details. Anything else?*
- ☐ _____ *Get details. Anything else?*
- ☐ _____ *Get details. Anything else?*
- ☐ Don't Know

18. Have you done anything that affected the cooling of your home?

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

If yes, 18a. What have you done?

- ☐ _____ *Get details. Anything else?*

- ☐ _____ *Get details. Anything else?*
☐ _____ *Get details. Anything else?*
☐ Don't Know

19. Have you done anything that affected the heating of your home?

- a. ☐ Yes
b. ☐ No
c. ☐ Don't Know

If yes, 19a. What have you done?

- ☐ _____ *Get details. Anything else?*
☐ _____ *Get details. Anything else?*
☐ _____ *Get details. Anything else?*
☐ Don't Know

20. Have you done anything that affected the lighting in your home?

- a. ☐ Yes
b. ☐ No
c. ☐ Don't Know

If yes, 20a. What have you done?

- ☐ _____ *Get details. Anything else?*
☐ _____ *Get details. Anything else?*
☐ _____ *Get details. Anything else?*
☐ Don't Know

21. Have you done anything with home computers or electronics?

- a. ☐ Yes
b. ☐ No
c. ☐ Don't Know

If yes, 21a. What have you done?

- ☐ _____ *Get details. Anything else?*
☐ _____ *Get details. Anything else?*
☐ _____ *Get details. Anything else?*
☐ Don't Know

22. Have you done anything to affect hot water heating in your home?

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

If yes, 22a. What have you done?

- ☐ _____ *Get details. Anything else?*
- ☐ _____ *Get details. Anything else?*
- ☐ _____ *Get details. Anything else?*
- ☐ Don't Know

23. Do you have a pool?

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

If yes, 23a. Did you make any changes to your pool's heating or filtering systems to make it more efficient?

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

If yes, 23b. What have you done?

- ☐ _____ *Get details. Anything else?*
- ☐ _____ *Get details. Anything else?*
- ☐ _____ *Get details. Anything else?*
- ☐ Don't Know

If they did not read the reports, Skip to question 31.

Now I am going to ask you some general satisfaction statements. On a scale from 1-10, with 1 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statements.

24. The reports are easy to read and understand.

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

If 7 or less, How could this be improved? _____

25. The energy saving tips in the report provided new ideas that I was not previously considering.

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

If 7 or less, How could this be improved? _____

26. I find the reports useful.

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

If 7 or less, How could this be improved? _____

27. I enjoy receiving and reading the reports.

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

If 7 or less, How could this be improved? _____

INDEX TABLE 28. I find the graphics helpful in understanding how my energy usage compares to others like me.

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

If 7 or less, How could this be improved? _____

LINE GRAPH 28. I find the graphics helpful in understanding how my energy usage compares to others like me.

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

If 7 or less, How could this be improved? _____

LINE GRAPH 28a. I find the graphics helpful in understanding how my energy usage changes over the seasons.

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

If 7 or less, How could this be improved? _____

29. Overall I am satisfied with the reports.

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

If 7 or less, How could this be improved? _____

30. Have you shared or discussed this report with others?

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

If yes, 30a. Who did you share it with?

- a. ☐ Family
- b. ☐ Friends
- c. ☐ Neighbors
- d. ☐ Co-workers
- e. ☐ Other: _____
- f. ☐ Don't Know

As a follow up to the report, Duke Energy is interested in providing further services that might be of interest to customers. I am going to read a list of possible services that Duke

Energy may consider offering. On a scale from 1-10, with 1 indicating that you would be very uninterested, and 10 indicating that you would be very interested agree, please rate your interest in the following services.

31. Help in finding weatherization contractors to make your home more efficient

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

32. Help in finding energy efficient equipment and appliances

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

33. Rebates for energy efficient home improvements

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

34. Inspection services of work performed by contractors

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

35. Financing for energy efficient home improvements

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

36. Home energy audits or inspections of your home with specific recommendations for improvements

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

37. Social Networking sites such as Facebook and Twitter to read about or discuss energy efficient solutions with energy experts.

1 2 3 4 5 6 7 8 9 10

☐ Don't Know

38. Is there anything that you would like to see changed about the report?

Response: _____

The next set of questions will help us understand how you make decisions. When I read the statements, please tell me if you Strongly Disagree, Moderately Disagree, Slightly Disagree, Slightly Agree, Moderately Agree, or Strongly Agree.

39. I find that a well ordered life with regular hours suits my temperament.

- a. ☐ Strongly Disagree
- b. ☐ Moderately Disagree
- c. ☐ Slightly Disagree
- d. ☐ Slightly Agree
- e. ☐ Moderately Agree
- f. ☐ Strongly Agree
- g. ☐ Don't Know
- h. ☐ Refused

40. I don't like to be with people who are capable of unexpected actions.

- a. ☐ Strongly Disagree
- b. ☐ Moderately Disagree
- c. ☐ Slightly Disagree
- d. ☐ Slightly Agree
- e. ☐ Moderately Agree
- f. ☐ Strongly Agree
- g. ☐ Don't Know

41. I find that establishing a consistent routine enables me to enjoy life more.

- a. ☐ Strongly Disagree
- b. ☐ Moderately Disagree
- c. ☐ Slightly Disagree
- d. ☐ Slightly Agree
- e. ☐ Moderately Agree
- f. ☐ Strongly Agree
- g. ☐ Don't Know

42. I enjoy having a clear and structured mode of life.

- a. ☐ Strongly Disagree
- b. ☐ Moderately Disagree
- c. ☐ Slightly Disagree
- d. ☐ Slightly Agree
- e. ☐ Moderately Agree
- f. ☐ Strongly Agree
- g. ☐ Don't Know

43. **I like to have a place for everything and everything in its place.**

- a. ☐ Strongly Disagree
- b. ☐ Moderately Disagree
- c. ☐ Slightly Disagree
- d. ☐ Slightly Agree
- e. ☐ Moderately Agree
- f. ☐ Strongly Agree
- g. ☐ Don't Know

44. **I dislike unpredictable situations.**

- a. ☐ Strongly Disagree
- b. ☐ Moderately Disagree
- c. ☐ Slightly Disagree
- d. ☐ Slightly Agree
- e. ☐ Moderately Agree
- f. ☐ Strongly Agree
- g. ☐ Don't Know

I would now like you ask you a few demographic questions before we get off the phone.

45. **What is the approximate square footage of the heated areas of your home?**

- a. ☐ less than 500
- b. ☐ 500-999
- c. ☐ 1000-1999
- d. ☐ 2000-2499
- e. ☐ 2500-2999
- f. ☐ 3000-3499
- g. ☐ 4000 or more
- h. ☐ Other: _____
- i. ☐ Don't Know

46. **Does your home have an attic?**

- a. ☐ Yes
- b. ☐ No
- c. ☐ Don't Know

47. Does your home have a basement?

- a. ☐ Yes **47a. Is the basement area heated?**
 - 1. ☐ Yes
 - 2. ☐ No
 - 3. ☐ Part of it is heated
 - 4. ☐ Don't Know
- b. ☐ No
- c. ☐ Don't Know

48. What is the fuel used in your primary heating system?

- a. ☐ Electric
- b. ☐ Natural Gas
- c. ☐ Oil
- d. ☐ Propane
- e. ☐ No heating system
- f. ☐ Other: _____
- g. ☐ Don't Know

49. How old is your heating system?

- a. ☐ 0-4 years
- b. ☐ 5-9 years
- c. ☐ 10-14 years
- d. ☐ 15-19 years
- e. ☐ 20 years or more
- f. ☐ Don't Know

50. What kind of cooling system is in your home?

- a. ☐ None
- b. ☐ Central Air
- c. ☐ Heat Pump
- d. ☐ Window/Wall AC units
- e. ☐ Other: _____
- f. ☐ Don't Know

If they have a cooling system:

50a. How old is your cooling system?

- a. ☐ 0-4 years
- b. ☐ 5-9 years
- c. ☐ 10-14 years
- d. ☐ 15-19 years
- e. ☐ 20 years or more
- f. ☐ Don't Know

51. What is your thermostat setting for a typical heating day on a winter afternoon?

- a. ☐ <67 degrees
- b. ☐ 67-70 degrees
- c. ☐ 71-73 degrees
- d. ☐ 74-77 degrees
- e. ☐ >77 degrees
- f. ☐ Thermostat off
- g. ☐ No thermostat
- h. ☐ Don't Know

52. What is your thermostat setting for a typical cooling day on a summer afternoon?

- a. ☐ <69 degrees
- b. ☐ 69-72 degrees
- c. ☐ 73-76 degrees
- d. ☐ 77-78 degrees
- e. ☐ >78 degrees
- f. ☐ Thermostat off
- g. ☐ No thermostat
- h. ☐ Don't Know

53. Including yourself, how many people live in your home?

- a. ☐ 1
- b. ☐ 2
- c. ☐ 3
- d. ☐ 4
- e. ☐ 5
- f. ☐ 6
- g. ☐ 7
- h. ☐ 8 or more

If 2 or more people in home:

53a. How many of them are teenagers? (age 13-19)

- a. ☐ 0
- b. ☐ 1
- c. ☐ 2
- d. ☐ 3
- e. ☐ 4
- f. ☐ 5
- g. ☐ 6
- h. ☐ 7
- i. ☐ 8 or more

If they ask why: Explain that teenagers are generally associated with higher energy use.


We've reached the end of the survey. As I mentioned earlier, we would like to send you \$10 for your time and feedback today. Should we send the \$10 to <address on file>, or would a different address be better?

- a. ☐ Address on file
- b. ☐ Other: _____

You should receive your \$10 in about 2-3 weeks. Thanks again for your time today!
(politely end call)

Appendix C: Sample HECR Mailing: Index Table

Home Energy Comparison Report
 DECEMBER 2010



Whose electricity usage is being compared to mine?

738 Households Compared

- In the Piedmont area
- Single family homes
- Non-electric heating
- 1600 - 2200 sq. ft.
- Built in 1963-1973


Account Number

DECEMBER 2010

HOW AM I DOING?

HOME EFFICIENCY SCORE

Using a scale of 0-100
Higher scores are better



69

LAST MONTH


80

LAST DECEMBER


Uh oh! Looks like your score dropped from last month and from last year.

HOMES IN THE PIEDMONT AREA


HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?



AVERAGE HOME
\$92



YOUR HOME
\$80



EFFICIENT HOME
\$63


Not bad. A few changes can make a world of difference. Try one of the tips below to improve your costs.

?

QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com

Are you paying too much at the pump?

If your heat pump is more than a **decade old**, odds are that you can replace it with **new technology** that is **20-40% more efficient**. Start shopping around now while Old Faithful still has some life left in it. Duke can help. Go to www.duke-energy.com/south-carolina/savings/smart-saver.asp to learn more about our equipment rebates.



FAST FACT

A dripping faucet can leak **48 gallons** in a week... more than many water heaters hold! **Fix leaks quickly** - especially hot water leaks, which **waste water AND energy**.

Winning the Thermostat Wars.

Is one person - or space - in your home always **colder than the others**? Quit fighting over the thermostat. A small, **efficient space heater** adds warmth only where it's needed, at a **fraction of the energy cost**.

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November 8, 2011

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Duke Energy

Appendix D: Sample HECR Mailing: Line Graph

Home Energy Comparison Report
JANUARY 2011



Whose electricity usage is being compared to mine?

599 Households Compared

- In the Amelia area
- Single family homes
- Non-electric heating
- 1700 - 2300 sq. ft.
- Built in 1993-2003

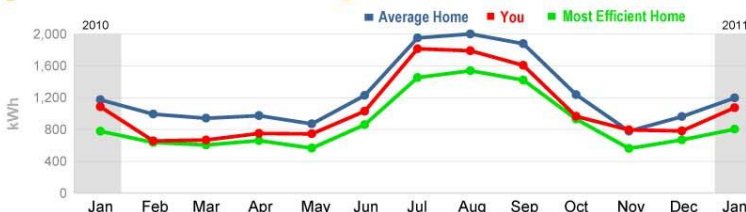
Account Number

HOW AM I DOING?



Not bad. A few changes can make a world of difference. Try one of the tips below to improve your costs.

HOW AM I DOING OVER TIME?



About the same as last January. In the last 12 months, your home used 16% less energy than the average home.

The Resolution Solution

We can't help you get fit, find a new job, or clean out your garage. But our **Energy Solutions @ Home** experts can help you **whip your home** - and energy bill - **into shape**.

Our Energy Experts will work with you to **identify** hard-to-spot areas where your home may be **leaking air and money**. And our professionally installed improvements will **increase your comfort and save you money** for years to come.

Find out more by calling our **Energy Experts** at 888-873-3853.



QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com



FAST FACT Attic temperatures can range from 120 degrees in the summer to well below 0 in the winter. Adding 6" of insulation can save 10-40% of energy used by your heater or AC.

The Weather Outside's Still Frightful

The holidays may be over, but winter isn't. You can **help your neighbors** stay warm by giving one more very **special gift**. Contribute to our **Share The Warmth** program today, and we will match your **tax-deductible** donation dollar-for-dollar. That's a **very warm** feeling.

Learn more at www.duke-energy.com/community/programs/share-the-warmth.asp

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Appendix E: What It Means to be Energy Efficient

The survey asked the following of HECR customers: **In your own words, please tell me what it means to be energy efficient.** Their responses are presented below.

Non-Specific Responses, n=228

- "Being energy efficient means saving money." (N= 66)
- "Use the least amount of energy necessary." (N= 39)
- "Don't waste energy." (N= 38)
- "Try to use less energy." (N= 20)
- "Being energy efficient means saving money and helping the environment." (N= 13)
- "Conserving energy." (N= 8)
- "I do not know." (N= 8)
- "Try to use less energy while staying comfortable." (N= 5)
- "Conserving energy and natural resources." (N= 4)
- "Using resources wisely." (N= 4)
- "Getting more for less." (N= 3)
- "Saving energy and going green." (N= 3)
- "Being aware of energy use." (N= 2)
- "Cutting back on our energy use." (N= 2)
- "Don't be an energy hog." (N= 2)
- "Don't waste energy and help Duke Energy." (N= 2)
- "Being a good steward of energy resources." (N= 1)
- "Being aware of energy use and being green." (N= 1)
- "Being conscious of how much energy I use and teaching my family the same." (N= 1)
- "Being conscious of how much energy I use." (N= 1)
- "Being smart by being green." (N= 1)
- "Keeping up to date on ways to save energy." (N= 1)
- "Using clean and non-polluting energy sources." (N= 1)
- "Using common sense without going overboard." (N= 1)
- "Using energy wisely." (N= 1)

Specific Responses, n=27

- "Using insulation and weatherstripping to stay comfortable and save energy." (N= 5)
- "Lowering the thermostat and keeping windows sealed." (N= 3)
- "Using CFLs and lowering the thermostat." (N= 3)
- "Keeping my house sealed and insulated." (N= 2)
- "Turning off unnecessary lights and appliances." (N= 2)
- "Turning off unnecessary lights and having proper insulation." (N= 2)
- "Using energy efficient equipment" (N= 2)
- "Closing doors, turning off lights and weatherstripping my home." (N= 1)
- "Conserving energy by minimizing our use of Heating and Air-Conditioning." (N= 1)
- "Spending money up front to save money later." (N= 1)

- "Take energy efficiency into account when buying appliances." (N= 1)
- "Turning off unnecessary lights." (N= 1)
- "Using CFLs, having proper insulation and weatherstripping, and turning off lights." (N= 1)
- "Using efficient equipment and sealing windows and doors." (N= 1)
- "Using energy and resources wisely, including off-peak hours." (N= 1)

Appendix F: What Surveyed Customers Do to be More Energy Efficient

The survey asked the following question of HECCR customers: **When you think about what you and your household does or can do to decrease energy consumption, what things come to mind? Anything else?** Their responses are presented below.

- Turn off lights (N = 117)
- Lower thermostat (N = 89)
- CFLs (N = 78)
- Insulate (N = 58)
- EE windows (N = 51)
- EE Appliances & windows (N = 31)
- Seal (N = 29)
- Thermostat low in winter & high in summer (N = 29)
- Reduce drafts (N = 19)
- Wash full laundry loads (N = 19)
- Use appliances less (N = 18)
- Unplug (N = 13)
- Conserve hot water (N = 10)
- EE HVAC (N = 10)
- Blinds (N = 8)
- Programmable thermostat (N = 8)
- Cold water laundry (N = 7)
- Water heater blanket (N = 7)
- Close doors (N = 6)
- Close off unused rooms (N = 6)
- Water heater at 120 (N = 6)
- Conserve water (N = 5)
- Shorter showers (N = 5)
- Turn off electronics (N = 5)
- Drapes (N = 4)
- EE Doors (N = 4)
- Heat with wood (N = 4)
- Minimize AC use (N = 4)
- Turn off TV (N = 4)
- Air dry laundry (N = 3)
- Ceiling fans (N = 3)
- EE water heater (N = 3)
- Fireplace (N = 3)
- I don't know." (N = 3)
- Turn off lights & electronics (N = 3)
- Attic fan (N = 2)

- Close windows (N = 2)
- Consolidate errands with car (N = 2)
- Curtains (N = 2)
- Don't pause at open refrigerator door (N = 2)
- EE House (N = 2)
- Keep refrigerator door closed (N = 2)
- Maintain furnace (N = 2)
- Shrink wrap (N = 2)
- Solar heating (N = 2)
- Space heaters (N = 2)
- Sweaters (N = 2)
- Turn off water heater when away (N = 2)
- Water heater (N = 2)
- 2 HVAC zones (N = 1)
- Avoid using electric heat (N = 1)
- Blankets (N = 1)
- Conserve (N = 1)
- Dimmer switches (N = 1)
- Doing away with one of their refrigerators. (N = 1)
- double heat pump - separate zones (N = 1)
- EE roof (N = 1)
- Fans (N = 1)
- Furnace filter (N = 1)
- Go to bed early (N = 1)
- Home renovations (N = 1)
- Insulated hot tub (N = 1)
- Keep fireplace damper closed (N = 1)
- Keeps AC fan running constantly (N = 1)
- Maintain AC (N = 1)
- New duct work & air filtering system (N = 1)
- New Siding (N = 1)
- Off peak (N = 1)
- Outdoor lights cut back about 30 minutes. (N = 1)
- Power strip (N = 1)
- Ridge vent on roof (N = 1)
- Roof (N = 1)
- Use a cooler (N = 1)
- Use hot tub less (N = 1)
- Use HPS outdoor lights (N = 1)
- Water heater - Tankless (N = 1)

Appendix G: Changes Surveyed HECR Customers Would Like to See, by Group

Monthly Index

- "Duke should base the comparison on more accurate and detailed data - for example, my vaulted ceilings are 20-feet high, so I have to run fans all the time. I feel the comparison is too vague & inaccurate - Duke should try to capture more relevant data, such as shade factor."
- "Duke should get more accurate data for sake of comparison."
- "Duke should have website referral for energy-saving tips and send emails with customized tips."
- "Duke should offer the report in electronic format, and get more accurate information about homes (e.g. its age)."
- "I pay my bills online and would like a link to HECR."
- "The report should be discontinued because it costs me money as a customer, but incorporate the comparison to similar homes into my monthly bill."
- "The report should be more detailed and have a narrower basis of comparison to similar homes."
- "The report should have a usage graph covering 24 months."
- "The report should include more advanced tips."
- "The report should incorporate more variables to make it a fairer comparison."
- "The report should offer more advanced tips for truly motivated customers who practice energy efficiency already."
- "The report should provide incentives for lower rates."
- "The report should stress potential bill savings more, and include more detailed, accurate home comparison data."
- "The report should use a degree-day usage comparison for more accuracy."
- "The report should use a fairer basis of comparison than size and age - take into account pools, workshops, etc."
- "The report should use a more detailed baseline for comparison and tips."
- "The tips should be more legible, in bullet point form, for example."

Monthly Line

- "Duke should provide better customer service when I respond to their CFL offer."
- "Get my house size correct."
- "I'd rather the report come with the bill or on email. I just need an accurate comparison."
- "My single story house has a pool and I believe the report does not reflect the energy challenges that these factors pose."
- "The report should be available via email."
- "The report should be sent just once or twice a year."
- "The report should have further suggestions regarding energy savings and potential savings."
- "The report should include the number of occupants for a more accurate comparison."
- "The report should provide a detailed explanation of where we use so much. What is the basis of comparison to similar homes?"

- "The report would be more useful if it used my correct house size."

Quarterly Index

- The report should be included with my monthly bill. (N = 2)
- The report should be in electronic form, Duke should provide a chat room or conference calls for customers to discuss efficiency issues.
- The report should be very clear and easy to understand at all levels of education.
- The report should consider family size when making comparisons.
- The report should make more specific recommendations and suggestions.
- The report should provide more detail on how they get the comparison.
- The report should recommend specific brands of appliances.
- The report should use accurate home information (I filled out a survey 5 years ago - send me a new questionnaire).
- The report should use accurate information about homes for comparison - mine is actually 3,200 sq. ft.

Quarterly Line

- "Duke should offer the report and allow customers to opt out. My home is already as energy-efficient as possible. I have no complaints about Duke's service."
- "Please don't share the information with the federal government or mandate energy efficiency. I am afraid of being penalized in the future and am not a believer in the climate change theory."
- "The report does not factor in my mobile home which is heated to prevent pipes freezing."
- "The report should allow for disabled people's medical equipment (my oxygen machine)."
- "The report should give more details about pools or hot-tubs and the types of energy efficient equipment for them."
- "The report should have a year-to-year comparison of usage."
- "The report should provide a Spanish language version."
- "The report should provide more details on the basis of comparison."

Appendix H: Surveyed HECR Customer Demographics

Surveyed HECR customers were asked a series of demographic questions at the end of the survey. The results are for internal Duke Energy use and are presented for the full surveyed population (n=260) in a separate document.

Appendix I: Summary of Tips and Messages

South Carolina Customers: Quarterly Reports - Tips and Messages					
Drop Date 1	Drop Date 2	Mailings	Name of PDFs	Tips (Key Words)	Tips (Key Words)
May 28	June 11	What Is This/ Programmable/ Fridge Open	SCWave1WhatIsThis	<ul style="list-style-type: none"> • Raise thermostat • Programmable thermostat • Pause at fridge 	
Aug 26	Sept 13	Beat The Heat/ CFL/Printer	SCWave4HeatCFL	<ul style="list-style-type: none"> • Printers 	<ul style="list-style-type: none"> • Energy assistance <ul style="list-style-type: none"> ◦ Share the Warmth ◦ Fan relief • CFLs
Nov 24	Dec 10	1. CFL/Football/ Fog 2. CFL/BRC/Fog 3. CFL/ESH/Fog 4. Bake/Football/ Fog 5. Football/BRC/ Fog 6. Football/ESH/ Fog	1. SCWave7CFLFootball 2. SCWave7CFLBRC 3. SCWave7CFLESH 4. SCWave7BakeFootball 5. SCWave7FootballBRC 6. SCWave7FootballESH	SCWave7CFLFootball <ul style="list-style-type: none"> • Bathroom mirror • Football party <ul style="list-style-type: none"> ◦ sweaters ◦ coolers ◦ insulated dishes SCWave7CFLBRC <ul style="list-style-type: none"> • Bathroom mirror SCWave7CFLESH <ul style="list-style-type: none"> • Bathroom fan SCWave7BakeFootball <ul style="list-style-type: none"> • Holiday baking • Bathroom mirror Football party <ul style="list-style-type: none"> ◦ sweaters ◦ coolers ◦ insulated dishes SCWave7FootballBRC <ul style="list-style-type: none"> • Bathroom mirror • Football party <ul style="list-style-type: none"> ◦ sweaters ◦ coolers ◦ insulated dishes SCWave7FootballESH <ul style="list-style-type: none"> • Bathroom mirror • Football party <ul style="list-style-type: none"> ◦ sweaters ◦ coolers ◦ insulated dishes 	SCWave7CFLFootball <ul style="list-style-type: none"> • Free CFL SCWave7CFLBRC <ul style="list-style-type: none"> • Free CFL Review card SCWave7CFLESH <ul style="list-style-type: none"> • Free CFL • ESH SCWave7FootballBRC <ul style="list-style-type: none"> • Review card SCWave7FootballESH <ul style="list-style-type: none"> • ESH

South Carolina Customers: Monthly Reports - Tips and Messages					
Drop Date 1	Drop Date 2	Mailings	Name of PDFs	Tips	Message
May 28	June 11	What Is This /Programmable/Fridge Open	SCWave1WhatIsThis	SCWave1WhatIsThis <ul style="list-style-type: none"> ○ Raise thermostat ○ Programmable thermostat ○ Pause at fridge 	
June 25	July 12	Received 1 of 2 messages: 1. Beat The Heat/CFL/ Printer 2. Beat The Heat/Smart Saver/Printer	SCWave2HeatCFL SCWave2HeatSS	SCWave2HeatCFL <ul style="list-style-type: none"> ○ Printers SCWave2HeatSS <ul style="list-style-type: none"> ○ Printers 	SCWave2HeatCFL <ul style="list-style-type: none"> ○ Energy assistance <ul style="list-style-type: none"> ▪ Share the Warmth ▪ Fan relief ○ CFLs SCWave2HeatSS <ul style="list-style-type: none"> ○ Energy assistance <ul style="list-style-type: none"> ▪ Share the Warmth ▪ Fan relief ○ Smart Saver
July 23	Aug 12	Temps Are On The Rise /Beach /Lock Closed Windows	SCWave3TempsBeach	SCWave3TempsBeach <ul style="list-style-type: none"> ○ Beach <ul style="list-style-type: none"> ▪ Unplug electronics ○ Lock windows ○ Fans ○ Drapes 	SCWave3TempsBeach <ul style="list-style-type: none"> ○ CFLs
Aug 26	Sept 13	Received 1 of 2 messages: 1. Green/ EE Videos/ Coffee 2. Green/ School/ Coffee Maker	SCWave4GreenVideos SCWave4GreenSchool	SCWave4GreenVideos <ul style="list-style-type: none"> ○ Coffeemakers SCWave4GreenSchool <ul style="list-style-type: none"> ○ Coffeemakers ○ Adjust thermostats & timers 	SCWave4GreenVideos <ul style="list-style-type: none"> ○ Clean energy ○ Videos SCWave4GreenSchool <ul style="list-style-type: none"> ○ Clean energy
Sept 29	Oct 12	Received 1 of 4 messages: 1. School/ESH Buckslip/Filters 2. School/Spiders/Filters 3. Spiders/Dryer/Filters 4. Spiders/ESH Buckslip/Filters	SCWave5SchoolESH SCWave5SchoolSpiders SCWave5SpidersDryer SCWave5SpidersESH	SCWave5SchoolESH <ul style="list-style-type: none"> ○ Furnace filter ○ Adjust thermostats & timers SCWave5SchoolSpiders <ul style="list-style-type: none"> ○ Spiders = drafts ○ Furnace filter ○ Adjust thermostats & timers SCWave5SpidersDryer <ul style="list-style-type: none"> ○ Spiders = drafts ○ Furnace filter ○ Dryer <ul style="list-style-type: none"> ▪ Back-to-back ▪ Filter ▪ Moisture sensor SCWave5SpidersESH <ul style="list-style-type: none"> ○ Spiders = drafts ○ Furnace filter 	SCWave5SchoolESH <ul style="list-style-type: none"> ○ ESH SCWave5SpidersESH <ul style="list-style-type: none"> ○ ESH
Oct 28	Nov 9	Received 1 of 3 messages: 1. BRC/Fall Back/ Blocked Vent 2. ESH/Fall Back/ Blocked Vent 3. Water Heater/Fall Back/ Blocked Vent	SCWave6BRCFallBack SCWave6WaterHeaterFallBack SCWave6ESHFallBack	SCWave6BRCFallBack <ul style="list-style-type: none"> ○ Unblock vents ○ Fall back <ul style="list-style-type: none"> ▪ thermostat ▪ timers ▪ Furnace filter ▪ cover AC SCWave6WaterHeaterFallBack <ul style="list-style-type: none"> ○ Wrap water heater ○ Unblock vents 	SCWave6BRCFallBack <ul style="list-style-type: none"> ○ Review card SCWave6ESHFallBack <ul style="list-style-type: none"> ○ Tax credits

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Appendices

				<ul style="list-style-type: none"> o Fall back <ul style="list-style-type: none"> ▪ thermostat ▪ timers ▪ Furnace filter ▪ cover AC SCWave6ESHFallBack <ul style="list-style-type: none"> o Unblock vents o Fall back <ul style="list-style-type: none"> ▪ thermostat ▪ timers ▪ Furnace filter ▪ cover AC 	
Nov 24	Dec 10	Received 1 of 2 messages: 1. CFL/Football/Fog 2. Bake/Football/Fog	SCWave7CFLFootbal SCWave7BakeFootbal	SCWave7CFLFootball <ul style="list-style-type: none"> o Bathroom fan o Football party <ul style="list-style-type: none"> ▪ sweaters ▪ coolers ▪ insulated dishes SCWave7BakeFootball <ul style="list-style-type: none"> o Holiday baking <ul style="list-style-type: none"> ▪ do all baking ▪ self clean after baking o Bathroom fan o Football party <ul style="list-style-type: none"> ▪ sweaters ▪ coolers ▪ insulated dishes 	SCWave7CFLFootball <ul style="list-style-type: none"> o Free CFL
Dec 27	Jan 11	Thermostat Wars/ Dripping Faucet	SCWave8HeatPump SCWave8DraftyWindow s	SCWave8HeatPump <ul style="list-style-type: none"> o Heat pump o Fix leaks o Space heater SCWave8DraftyWindow <ul style="list-style-type: none"> o Shrink Wrap o Fix leaks o Space heater 	
Jan 25		ESH/Share The Warmth/ Attic Insulation	SCWave9ESHShare TheWarmth	SCWave9ESHShareThe Warmth <ul style="list-style-type: none"> o Attic Insulation 	SCWave9ESHShareThe Warmth <ul style="list-style-type: none"> o ESH o Share the Warmth

Appendix J: All Examples of All HECR Mailings in Grayscale

Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
May 28	June 11	What Is This/ Programmable/ Fridge Open	SCWave1WhatIsThis	<ul style="list-style-type: none"> • Raise thermostat • Programmable thermostat • Pause at fridge 	

Home Energy Comparison Report
 SPRING 2010



Whose electricity usage is being compared to mine?

1,280 Households Compared


- In the Amelia area
- Single family homes
- Electric heating
- 1300 - 1900 sq. ft.
- Built in 1964-1974

Account Number

HOW AM I DOING?

HOME EFFICIENCY SCORE

*Using a scale of 0-100
Higher scores are better*



48

47

LAST
QUARTER

52

SPRING
2009

About the same. Let's see if you can add a few more points next quarter.

HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?

AVERAGE HOME

\$80

YOUR HOME

\$89

EFFICIENT HOME

\$51

Not bad. A few changes can make a world of difference. Try one of the tips below to improve your costs.

?

QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com

WHAT IS THIS?

We've sent you this report to **help you compare** your home's electricity cost to that of **similar homes** and find out ways to use energy more wisely.

Working together, we can build a sustainable energy future. Conserving energy is not only **good for the environment and your pocketbook**, but helps Duke Energy control costs.

If you do not wish to receive this report in the future, just let us know by using the contact information to the left.

QUICK TIP

Next time you're at the fridge, pause to think about what to get before opening the door

DID YOU KNOW?

With warm weather here, now is the time to think about your thermostat.

On average, **you can save up to 3%** on cooling **for every degree you raise** your thermostat during the summer.

With proper use of a programmable thermostat, you can save **\$180 a year** in energy costs for a typical, single-family home. (Source: Energy Star)

For more tips like this, visit www.duke-energy.com/ohio/savings/lower-your-bill.asp

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November 8, 2011

72

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Appendices

Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
June 25	July 12	Beat The Heat/CFL/ Printer	SCWave2HeatCFL	SCWave2HeatCFL o Printers	SCWave2HeatCFL o Energy assistance ▪ Share the Warmth ▪ Fan relief o CFLs

Home Energy Comparison Report JUNE 2010



Whose electricity usage is being compared to mine?

458 Households Compared

- In the Amelia area
- Single family homes
- Electric heating
- 1700 - 2300 sq. ft.
- Built in 1992-2002

Account Number
1111111115

HOW AM I DOING?

HOME EFFICIENCY SCORE

Using a scale of 0-100
Higher scores are better



22

LAST MONTH

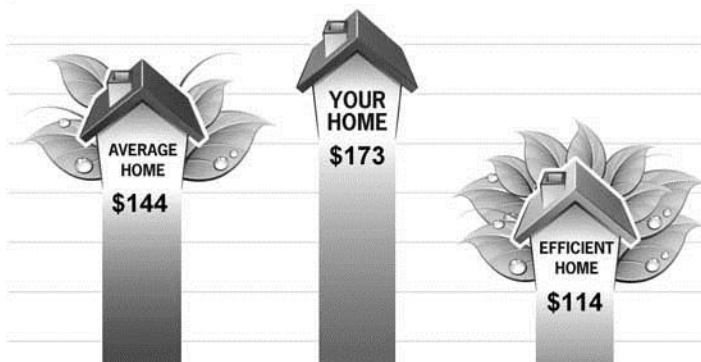
32

LAST JUNE

Good start. You've raised your score over last month. See if you can take it to the next level.

HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?

HOMES IN THE AMELIA AREA



You have a little room to lower your costs. Looks like your monthly costs are slightly higher than similar homes. Try one of the tips below to see if you can lower your electric bill.

Duke Energy helps SC's neediest beat the heat

You may already know of Duke Energy's **Share the Warmth** program, which helps our less fortunate customers pay their winter heating bills.

But did you know we also have 2 programs that provide funds to **SC customers in need** each summer?

This year, through our **Cooling Assistance** program, we provided \$160,000 to help customers with their summer bills. With **Fan Relief**, we donated \$40,000 to provide free fans for senior citizens.

Incandescent is so 20th Century!

"Old school" incandescent bulbs consume **4x as much energy** and burn out 10x faster. Reach for a compact fluorescent instead (CFL!) You'll **save up to \$30** over the life of each bulb.

If Duke Energy's 345,000 residential customers in SC replaced a **standard 75W bulb** to an equivalent CFL, we'd save enough energy to take about **25,000 cars off the road** for a year! (Source: Energy Star)



QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR

SaveEnergy@duke-energy.com



FAST FACT

Over 95% of electricity used by a home printer is while it's idle, waiting for something to do.

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
June 25	July 12	Beat The Heat/Smart Saver/Printer	SCWave2HeatSS	SCWave2HeatSS ○ Printers	SCWave2HeatSS ○ Energy assistance ▪ Share the Warmth ▪ Fan relief ○ Smart Saver

Home Energy Comparison Report
JUNE 2010



Whose electricity usage is being compared to mine?

327 Households Compared

- In the Hodges area
- Single family homes
- Electric heating
- 1300 - 1900 sq. ft.
- Built in 1978-1988

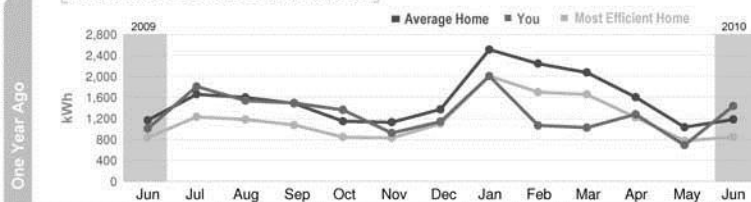
Account Number

HOW AM I DOING?



Not bad. A few changes can make a world of difference. Try one of the tips below to improve your costs.

HOW AM I DOING OVER TIME?



Higher than last June, but gaining ground. In the last 12 months, your home used 17% less energy than the average home.

Duke Energy helps SC's neediest beat the heat

You may already know of Duke Energy's **Share the Warmth** program, which helps our less fortunate customers pay their winter heating bills.

But did you know we also have 2 programs that provide funds to **SC customers in need** each summer?

This year, through our **Cooling Assistance** program, we provided \$160,000 to help customers with their summer bills. With **Fan Relief**, we donated \$40,000 to provide free fans for senior citizens.

Be more comfortable. Get \$200 as a bonus.

Need a reason to update an old AC? Buy a qualifying high-efficiency system through our **Smart Saver®** program and get a rebate to build on the savings you'll see through **lower cooling bills**.

Upgrade the system beyond Smart Saver® and you could **save up to \$1500 more** with a **Federal tax credit**.

Find details and contractors near you at www.duke-energy.com/south-carolina/savings.asp



QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR

SaveEnergy@duke-energy.com



FAST FACT

Over 95% of electricity used by a home printer is while it's idle, waiting for something to do.

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
July 23	Aug 12	Temps Are On The Rise /Beach /Lock Closed Windows	SCWave3TempsBeach	SCWave3TempsBeach <ul style="list-style-type: none"> Beach <ul style="list-style-type: none"> Unplug electronics Lock windows Fans Drapes 	SCWave3TempsBeach <ul style="list-style-type: none"> CFLs

Home Energy Comparison Report JULY 2010



Whose electricity usage is being compared to mine?

752 Households Compared

- In the Amelia area
- Single family homes
- Non-electric heating
- 1700 - 2300 sq. ft.
- Built in 1989-1999

Account Number

HOW AM I DOING?



Not bad. A few changes can make a world of difference. Try one of the tips below to lower your costs even further.

HOW AM I DOING OVER TIME?



Higher than last July, but gaining ground. In the last 12 months, your home used 39% less energy than the average home.

Temps are on the rise. Don't let energy bills follow!

A string of **very hot days** can play a factor into your energy use. Make a few easy adjustments to keep cool AND reduce your bill.

- Use oscillating fans to circulate the air for the room you're in. Remember to treat fans like lights - turn them off when you leave.
- Close the drapes on the sunny side of your home.
- Install compact fluorescent light (CFL) bulbs, which use less energy and give off less heat than incandescent bulbs.



QUICK TIP

Lock closed windows to maintain a tight seal between the pane and the frame

Before you take off for the beach...

Over time, your toaster or TV uses more energy **when you're not using it** than when you are. Many appliances and chargers continue to draw power just by being plugged in.

If you know you won't be using them for a while, **take a minute to unplug** these devices. You'll save some money to put towards your summer vacation instead of into a TV that no on watches for a week.



QUESTIONS?
888-873-3853
M-F 8AM-5PM

OR

SaveEnergy@duke-energy.com

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Aug 26	Sept 13	Green/ School/ Coffee Maker	SCWave4GreenSchool	SCWave4GreenSchool ○ Coffeemakers ○ Adjust thermostats & timers	SCWave4GreenSchool ○ Clean energy

Home Energy Comparison Report AUGUST 2010



Whose electricity usage is being compared to mine?

888 Households Compared

- In the Amelia area
- Single family homes
- Non-electric heating
- 1100 - 1700 sq. ft.
- Built in 1963-1973

Account Number

HOW AM I DOING?

HOME EFFICIENCY SCORE

Using a scale of 0-100
Higher scores are better

17

25 LAST MONTH
28 LAST AUGUST

Uh oh! Looks like your score dropped from last month and from last year.

HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?

YOUR HOME \$267

AVERAGE HOME \$196

EFFICIENT HOME \$146

You have a little room to lower your costs. Looks like your monthly costs are slightly higher than similar homes. Try one of the tips below to see if you can lower your electric bill.

It IS easy being green.

Think the only way to obtain **clean, sustainable power** is to buy your own solar panels or wind turbine? Think again. Duke Energy is committed to investing in a greener future in South Carolina. And we make it easy for you to join us. For as little as \$4, you can **show Mother Earth** you love her, too.

Visit www.duke-energy.com/south-carolina/renewable-energy.asp to learn more about our partnership with SC-based Palmetto Clean Energy.

School is in session!

Has your home received it's new schedule yet?

Here is your first assignment: Take a few moments to **reprogram your thermostat** with any changes to your family's schedule.

Want some extra credit? **Consider adjusting timers** on lights and appliances, as well. The days may still be hot, but they are already getting shorter!

FAST FACT


In one year, an idle coffee maker can draw enough electricity to cook 80 meals...or microwave 520.

QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Aug 26	Sept 13	Green/ EE Videos/ Coffee	SCWave4GreenVideos	SCWave4GreenVideos o Coffeemakers	SCWave4GreenVideos o Clean energy o Videos

Home Energy Comparison Report
 AUGUST 2010



Whose electricity usage is being compared to mine?

555 Households Compared


- In the Anderson area
- Single family homes
- Non-electric heating
- 1700 - 2300 sq. ft.
- Built in 1999-2009

Account Number

HOW AM I DOING?

HOME EFFICIENCY SCORE

*Using a scale of 0-100
Higher scores are better*



19

19


LAST MONTH

13


LAST AUGUST

Good start. You've raised your score over last year. See if you can take it to the next level.


HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?



AVERAGE HOME
\$225



YOUR HOME
\$305



EFFICIENT HOME
\$177

You have a little room to lower your costs. Looks like your monthly costs are slightly higher than similar homes. Try one of the tips below to see if you can lower your electric bill.


?

QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com

It IS easy being green.

Think the only way to obtain **clean, sustainable power** is to buy your own solar panels or wind turbine? Think again. Duke Energy is committed to investing in a greener future in South Carolina. And we make it easy for you to join us. For as little as \$4, you can **show Mother Earth you love her**, too.

Visit www.duke-energy.com/south-carolina/renewable-energy.asp to learn more about our partnership with SC-based Palmetto Clean Energy.



FAST FACT

In one year, an idle coffee maker can draw enough electricity to cook 80 meals...or microwave 520.

Show me the money!

Got a few minutes? We can save you a few dollars.

Whether you want to reduce your heating and cooling costs, lower humidity, or get the most from your household appliances, **our Energy Efficiency videos** can show you how.

Visit www.duke-energy.com/south-carolina/savings/energy-efficiency-videos.asp to view all five helpful videos.

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TecMarket Works

Appendices

Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Aug 26	Sept 13	Beat The Heat/ CFL/Printer	SCWave4HeatCFL	<ul style="list-style-type: none"> Printers 	<ul style="list-style-type: none"> Energy assistance <ul style="list-style-type: none"> Share the Warmth Fan relief CFLs

Home Energy Comparison Report AUGUST 2010



Whose electricity usage is being compared to mine?

623 Households Compared

- In the Amelia area
- Single family homes
- Non-electric heating
- 1400 - 2000 sq. ft.
- Built in 1993-2003

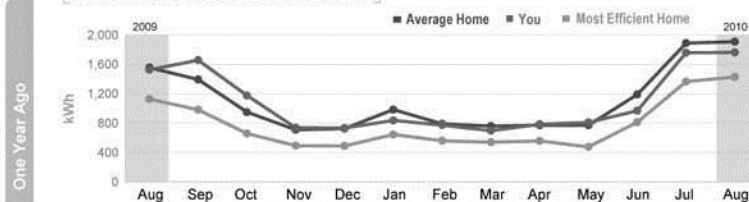
Account Number
11111111115

HOW AM I DOING?



Not bad. A few changes can make a world of difference. Try one of the tips below to improve your costs.

HOW AM I DOING OVER TIME?



About the same as last August. In the last 12 months, your home used about the same energy as the average home.

Duke Energy helps SC's neediest beat the heat

You may already know of Duke Energy's **Share the Warmth** program, which helps our less fortunate customers pay their winter heating bills.

But did you know we also have 2 programs that provide funds to **SC customers in need** each summer?

This year, through our **Cooling Assistance** program, we provided \$160,000 to help customers with their summer bills. With **Fan Relief**, we donated \$40,000 to provide free fans for senior citizens.

Incandescent is so 20th Century!

"Old school" incandescent bulbs consume **4x as much energy** and burn out 10x faster. Reach for a compact fluorescent instead (CFL!) You'll **save up to \$30** over the life of each bulb.

If Duke Energy's 345,000 residential customers in SC replaced a **standard 75W bulb** to an equivalent CFL, we'd save enough energy to take about **25,000 cars off the road** for a year! (Source: Energy Star)



FAST FACT

Over 95% of electricity is used by a home printer while it's idle, waiting for something to do.

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Sep 29	Oct 12	School/ESH Buckslip/Filters	SCWave5SchoolESH	SCWave5SchoolESH ○ Furnace filter ○ Adjust thermostats & timers	SCWave5SchoolESH ○ ESH

Home Energy Comparison Report SEPTEMBER 2010



Whose electricity usage is being compared to mine?

143 Households Compared

- In the Amelia area
- Single family homes
- Electric heating
- 1700 - 2300 sq. ft.
- Built in 1983-1993

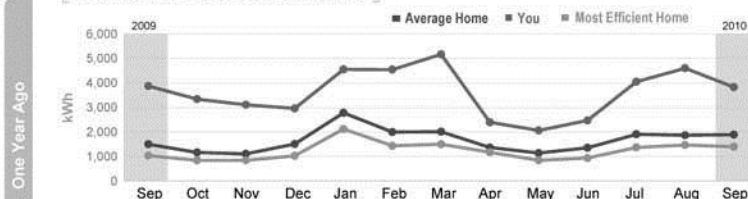
Account Number

HOW AM I DOING?



You have room to lower your costs. Looks like your monthly costs are significantly higher than similar homes. Have you tried one of the tips below to see if you can lower your bill?

HOW AM I DOING OVER TIME?



About the same as last September. However, in the last 12 months, your home used 123% more energy than the average home.

Uncomfortable with your report?

Have you already taken steps to try to change what this report is telling you?

We know you've worked hard to save energy on your own, and sometimes it's difficult to know what the next step should be.

That's why we developed a valuable service called **Energy Solutions @ Home®**.

See the enclosed flier for more details about our program.



FAST FACT Most manufacturers recommend changing filters every 4-6 weeks (or more often if you have pets!)

School is in session!

Has your home received it's new schedule yet?

Here is your first assignment: Take a few moments to **reprogram your thermostat** with any changes to your family's schedule.

Want some extra credit? Consider **adjusting timers** on lights and appliances, as well. The days may still be warm, but they are already getting shorter!



QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR

SaveEnergy@duke-energy.com

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Sept 29	Oct 12	School/ Spiders/ Filters	SCWave5SchoolSpiders	SCWave5SchoolSpiders o Spiders = drafts o Furnace filter o Adjust thermostats & timers	

Home Energy Comparison Report SEPTEMBER 2010



Whose electricity usage is being compared to mine?

617 Households Compared

- In the Amelia area
- Single family homes
- Non-electric heating
- 1400 - 2000 sq. ft.
- Built in 1993-2003

Account Number

HOW AM I DOING?

HOME EFFICIENCY SCORE

Using a scale of 0-100
Higher scores are better



61

LAST MONTH

100

LAST SEPTEMBER

Uh oh! Looks like your score dropped from last month and from last year.

HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?

SEPTEMBER 2010
HOMES IN THE AMELIA AREA



Not bad. A few changes can make a world of difference. Try one of the tips below to improve your costs.

School is in session!

Has your home received it's new schedule yet?

Here is your first assignment: Take a few moments to **reprogram your thermostat** with any changes to your family's schedule.

Want some extra credit? Consider **adjusting timers** on lights and appliances, as well. The days may still be warm, but they are already getting shorter!



FAST FACT Most manufacturers recommend changing filters every 4-6 weeks (or more often if you have pets!)

Q. What do spiders know about your house?

A. Where the drafts are. If spider webs keep appearing in the same place, they're a good indicator of unwanted drafts.

Find and seal the air leak, and you'll **send those spiders packing.** You'll also lighten the load on your system... and your wallet.



QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR

SaveEnergy@duke-energy.com

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TecMarket Works

Appendices

Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Sept 29	Oct 12	Spiders/ Dryer/ Filters	SCWave5SpidersDryer	SCWave5SpidersDryer ○ Spiders = drafts ○ Furnace filter ○ Dryer <ul style="list-style-type: none"> ▪ Back-to-back ▪ Filter ▪ Moisture sensor 	

Home Energy Comparison Report
SEPTEMBER 2010



Whose electricity usage is being compared to mine?

832 Households Compared

- In the Williamston area
- Single family homes
- Non-electric heating
- 1700 - 2300 sq. ft.
- Built in 1964-1974

Account Number

HOW AM I DOING?

HOME EFFICIENCY SCORE

*Using a scale of 0-100
Higher scores are better*

60

56

LAST MONTH

73

LAST SEPTEMBER

Not bad. Looks like your score was better last year, but about the same as last month.

HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?

AVERAGE HOME
\$169

YOUR HOME
\$150

EFFICIENT HOME
\$123

Not bad. A few changes can make a world of difference. Try one of the tips below to improve your costs.

?

QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com

Helpful hints to help your dryer out

If you do multiple loads of laundry, **dry them back-to-back.** Your dryer is "pre-heated" by the first load.

Clean the lint filter before every load to make sure your dryer works efficiently.

When it's time to buy a new dryer, **consider one with a moisture sensor.** Not only will this save energy, it saves wear and tear on your clothes caused by over-drying.

FAST FACT

Most manufacturers recommend changing filters every 4-6 weeks (or more often if you have pets!)

Q. What do spiders know about your house?


A. Where the drafts are. If spider webs keep appearing in the same place, they're a good indicator of unwanted drafts.

Find and seal the air leak, and you'll **send those spiders packing.** You'll also lighten the load on your system... and your wallet.

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Sept 29	Oct 12	Spiders/ESH Buckslip/Filters	SCWave5SpidersESH	SCWave5SpidersESH ○ Spiders = drafts ○ Furnace filter	SCWave5SpidersESH ○ ESH

Home Energy Comparison Report
 SEPTEMBER 2010



Whose electricity usage is being compared to mine?

299 Households Compared


- In the Greenville area
- Single family homes
- Electric heating
- 1400 - 2000 sq. ft.
- Built in 1935-1945

Account Number

HOW AM I DOING?

HOME EFFICIENCY SCORE

*Using a scale of 0-100
Higher scores are better*



20

27


LAST MONTH

13


LAST SEPTEMBER

Better than last year, but your score last month was higher.


HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?



AVERAGE HOME
\$168



YOUR HOME
\$233



EFFICIENT HOME
\$119

You have a little room to lower your costs. Looks like your monthly costs are slightly higher than similar homes. Try one of the tips below to see if you can lower your electric bill.

?

QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com


Uncomfortable with your report?

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We know you've worked hard to save energy on your own, and sometimes it's difficult to know what the next step should be.

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Q. What do spiders know about your house?

A. Where the drafts are. If spider webs keep appearing in the same place, they're a good indicator of unwanted drafts.

Find and seal the air leak, and you'll send those spiders packing. You'll also lighten the load on your system... and your wallet.

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Oct 28	Nov 9	BRC/Fall Back/Blocked Vent	SCWave6BRCFallBack	SCWave6BRCFallBack ○ Unblock vents ○ Fall back <ul style="list-style-type: none"> ▪ thermostat ▪ timers ▪ Furnace filter ▪ cover AC 	SCWave6BRCFallBack ○ Review card

Home Energy Comparison Report OCTOBER 2010



Whose electricity usage is being compared to mine?

282 Households Compared

- In the Inman area
- Single family homes
- Electric heating
- 1200 - 1800 sq. ft.
- Built in 1989-1999

Account Number

HOW AM I DOING?

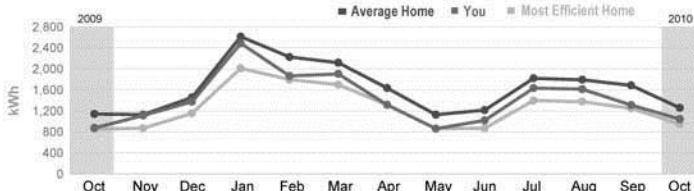
9/6/2010 - 10/8/2010



Not bad. A few changes can make a world of difference. Try one of the tips below to lower your costs even further.

HOW AM I DOING OVER TIME?

One Year Ago



About the same as last October. In the last 12 months, your home used 10% less energy than the average home.

Everything Correct?

We admit it. This report is based on some assumptions about your home. Would you **please take a minute to review the attached card** and let us know if we've got everything right? If not, please set us straight! The postage is on us.

Fall Back...Already?

It's been one hot summer! Amazingly, it's time to **reset our clocks** and **switch our thermostats** from "cool" to "heat."

While you're at it, now is an ideal time to:

- 1) **reset** your timers
- 2) **replace** your furnace filter
- 3) **reprogram** your thermostat
- 4) **remove, or cover and seal,** any window air conditioners



QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR

SaveEnergy@duke-energy.com



FAST FACT Registers and vents blocked by furniture or drapes can cause uneven and inefficient heating.

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Oct 28	Nov 9	ESH/Fall Back/ Blocked Vent	SCWave6ESHFallBack	SCWave6ESHFallBack <ul style="list-style-type: none"> ○ Unblock vents ○ Fall back <ul style="list-style-type: none"> ▪ thermostat ▪ timers ▪ Furnace filter ▪ cover AC 	SCWave6ESHFallBack <ul style="list-style-type: none"> ○ Tax credits

Home Energy Comparison Report
OCTOBER 2010



Whose electricity usage is being compared to mine?

282 Households Compared

- In the Greenville area
- Single family homes
- Electric heating
- 1200 - 1800 sq. ft.
- Built in 1993-2003

Account Number

?

QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com

HOW AM I DOING?

HOME EFFICIENCY SCORE

*Using a scale of 0-100
Higher scores are better*

26

29

LAST MONTH

43

LAST OCTOBER

Not bad. Looks like your score was better last year, but about the same as last month.

HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?

AVERAGE HOME
\$138

YOUR HOME
\$185

EFFICIENT HOME
\$104

You have a little room to lower your costs. Looks like your monthly costs are slightly higher than similar homes. Try one of the tips below to see if you can lower your electric bill.

credit [krédit] n.

1. Reward for good work
2. A name listed at the end of a movie
3. An IRS benefit you may miss

The federal government's home energy tax credit expires at the end of the year. Call 888-873-3853 to speak with our Energy Experts who can help you qualify for the credit and make your home more energy efficient. **Act now - all work must be completed by Dec. 31, 2010.**

Call 888-873-3853 today.
www.Duke-Energy.com/esh

Fall Back...Already?

It's been one hot summer! Amazingly, it's time to **reset** our clocks and **switch** our **thermostats** from "cool" to "heat."

While you're at it, now is an ideal time to:

- 1) **reset** your timers
- 2) **replace** your furnace filter
- 3) **reprogram** your thermostat
- 4) **remove, or cover and seal,** any window air conditioners

FAST FACT

Registers and vents blocked by furniture or drapes can cause uneven and inefficient heating.

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November 8, 2011

84

Duke Energy

TecMarket Works

Appendices

Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Oct 28	Nov 9	Water Heater/Fall Back/Blocked Vent	SCWave6WaterHeaterFallBack	SCWave6WaterHeaterFallBack ○ Wrap water heater ○ Unblock vents ○ Fall back <ul style="list-style-type: none"> ▪ thermostat ▪ timers ▪ Furnace filter ▪ cover AC 	

Home Energy Comparison Report
OCTOBER 2010



Whose electricity usage is being compared to mine?

238 Households Compared

- In the Greer area
- Single family homes
- Electric heating
- 3200 - 3800 sq. ft.
- Built in 1965-1975

Account Number

HOW AM I DOING?

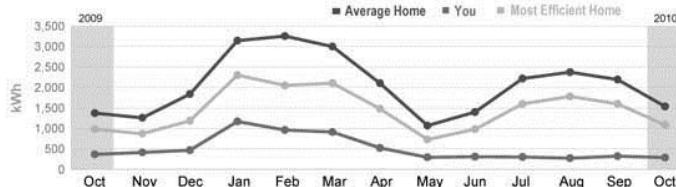
9/3/2010 - 10/4/2010



Keep it up! Share your success with others! Let us know how you manage your energy use using the contact information below!

HOW AM I DOING OVER TIME?

One Year Ago



Improved over last October. In the last 12 months, your home used 75% less energy than the average home.

Hugs for Heaters

Your water heater keeps water hot and ready for you 24X7. Take a few minutes to say **thanks!** Insulation "blankets" sold at most hardware stores are **quick and easy** to install. Your water heater will thank you by using **LESS energy and lasting longer, too.**

Fall Back...Already?

It's been one hot summer! Amazingly, it's time to **reset our clocks and switch our thermostats** from "cool" to "heat."

While you're at it, now is an ideal time to:

- 1) **reset** your timers
- 2) **replace** your furnace filter
- 3) **reprogram** your thermostat
- 4) **remove, or cover and seal,** any window air conditioners



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FAST FACT

Registers and vents blocked by furniture or drapes can cause uneven and inefficient heating.

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Nov 24	Dec 10	Bake/Football/Fog	SCWave7BakeFootball	SCWave7BakeFootball <ul style="list-style-type: none"> • Holiday baking • Bathroom mirror • Football party <ul style="list-style-type: none"> ○ sweaters ○ coolers ○ insulated dishes 	

Home Energy Comparison Report
NOVEMBER 2010



Whose electricity usage is being compared to mine?

869 Households Compared

- In the Gaffney area
- Single family homes
- Non-electric heating
- 1300 - 1900 sq. ft.
- Built in 1963-1973

Account Number

HOW AM I DOING?

HOME EFFICIENCY SCORE

Using a scale of 0-100
Higher scores are better

1

2
LAST MONTH

10
LAST NOVEMBER

Not bad. Looks like your score was better last year, but about the same as last month.

HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?

HOMES IN THE GAFFNEY AREA

AVERAGE HOME \$72

YOUR HOME \$190

EFFICIENT HOME \$52

You have room to lower your costs. Looks like your monthly costs are significantly higher than similar homes. Have you tried one of the tips below to see if you can lower your bill?

Add Energy To Taste

Is holiday baking a recipe for high energy bills? It needn't be. Make a day of it! You'll **save energy** because you won't have to preheat your oven multiple times. Invite friends and family to join in... and **savor the results**. When that last treat comes out of the oven, crank it right over to "self-clean." You'll save energy because you won't be starting with a cold oven!

Ah, football season!

Even if you're just "tailgating" around the television, you can still be festive... and energy smart. Try these tips:

- Lower your thermostat and encourage everyone to stay warm in their **favorite team sweatshirts** and hats.
- **Keep drinks and snacks in coolers** to avoid constantly opening the fridge.
- Use **insulated serving dishes** or carafes instead of leaving the oven and coffee pot on for hours.

FAST FACT

IN A FOG? Do you open a bath window in winter to clear foggy mirrors? Stop wasting energy and reduce moisture by installing a high efficiency fan in every bathroom.

QUESTIONS?
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M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Nov 24	Dec 10	CFL/BRC/Fog	SCWave7CFLBRC	SCWave7CFLBRC • Bathroom mirror	SCWave7CFLBRC • Free CFL • Review card

Whose electricity usage is being compared to mine?

859 Households Compared

- In the Anderson area
- Single family homes
- Non-electric heating
- 1700 - 2300 sq. ft.
- Built in 1990-2000

Account Number

HOW AM I DOING?

AVERAGE HOME
\$82

YOUR HOME
\$53

EFFICIENT HOME
\$55

Not bad. A few changes can make a world of difference. Try one of the tips below to lower your costs even further.

QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com

HOW AM I DOING OVER TIME?

About the same as last November. In the last 12 months, your home used 41% less energy than the average home.

Free and Easy!

CFL (Compact Fluorescent Light) bulbs burn cooler, use 75% less energy, and last 10x longer than incandescents. **Now they're FREE from Duke Energy!** Here are three easy ways to order yours today:

- Call 1-800-943-7585 and then press or say "1."
- Visit www.duke-energy.com/free-cfls.
- Log into your Online Services customer account.

Everything Correct?

We admit it. This report is based on some assumptions about your home. Would you please take a minute to review the attached card and let us know if we've got everything right? If not, please set us straight! The postage is on us.

FAST FACT **IN A FOG?** Do you open a bath window in winter to clear foggy mirrors? Stop wasting energy and reduce moisture by installing a high efficiency fan in every bathroom.

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Nov 24	Dec 10	CFL/Football/Fog	SCWave7CFLFootball	SCWave7CFLFootball <ul style="list-style-type: none"> • Bathroom mirror • Football party <ul style="list-style-type: none"> ○ sweaters ○ coolers ○ insulated dishes 	SCWave7CFLFootball <ul style="list-style-type: none"> • Free CFL

Home Energy Comparison Report
NOVEMBER 2010



Whose electricity usage is being compared to mine?

476 Households Compared

- In the Anderson area
- Single family homes
- Non-electric heating
- 1700 - 2300 sq. ft.
- Built in 1984-1994

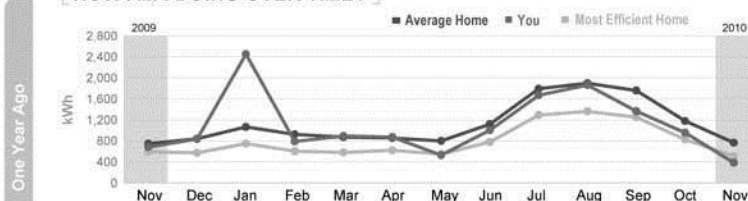
Account Number

HOW AM I DOING?



Not bad. A few changes can make a world of difference. Try one of the tips below to lower your costs even further.

HOW AM I DOING OVER TIME?



Improved over last November. In the last 12 months, your home used about the same energy as the average home.

Ah, football season!

Even if you're just "tailgating" around the television, you can still be festive... and energy smart. Try these tips:

- Lower your thermostat and encourage everyone to stay warm in their **favorite team sweatshirts** and hats.
- **Keep drinks and snacks in coolers** to avoid constantly opening the fridge.
- Use **insulated serving dishes** or carafes instead of leaving the oven and coffee pot on for hours.



FAST FACT **IN A FOG?** Do you open a bath window in winter to clear foggy mirrors? Stop wasting energy and reduce moisture by installing a high efficiency fan in every bathroom.

Everything Correct?

We admit it. This report is based on some assumptions about your home. Would you **please take a minute to review the attached card** and let us know if we've got everything right? If not, please set us straight! The postage is on us.



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TecMarket Works

Appendices

Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Nov 24	Dec 10	Football/BRC/Fog	SCWave7FootballBRC	SCWave7FootballBRC <ul style="list-style-type: none"> Bathroom mirror Football party <ul style="list-style-type: none"> sweaters coolers insulated dishes 	SCWave7FootballBRC <ul style="list-style-type: none"> Review card

Home Energy Comparison Report
NOVEMBER 2010



Whose electricity usage is being compared to mine?

476 Households Compared

- In the Anderson area
- Single family homes
- Non-electric heating
- 1700 - 2300 sq. ft.
- Built in 1984-1994

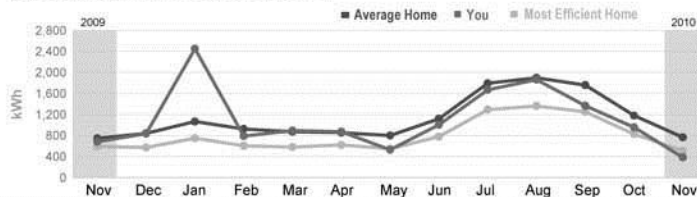
Account Number

HOW AM I DOING?



Not bad. A few changes can make a world of difference. Try one of the tips below to lower your costs even further.

HOW AM I DOING OVER TIME?



Improved over last November. In the last 12 months, your home used about the same energy as the average home.

Ah, football season!

Even if you're just "tailgating" around the television, you can still be festive... and energy smart. Try these tips:

- Lower your thermostat and encourage everyone to stay warm in their **favorite team sweatshirts** and hats.
- Keep drinks and snacks in coolers** to avoid constantly opening the fridge.
- Use **insulated serving dishes** or carafes instead of leaving the oven and coffee pot on for hours.



FAST FACT **IN A FOG?** Do you open a bath window in winter to clear foggy mirrors? Stop wasting energy and reduce moisture by installing a high efficiency fan in every bathroom.

Everything Correct?

We admit it. This report is based on some assumptions about your home. Would you **please take a minute to review the attached card** and let us know if we've got everything right? If not, please set us straight! The postage is on us.



QUESTIONS?
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OR

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Nov 24	Dec 10	Football/ESH/Fog	SCWave7FootballESH	SCWave7FootballESH <ul style="list-style-type: none"> Bathroom mirror Football party <ul style="list-style-type: none"> sweaters coolers insulated dishes 	SCWave7FootballESH <ul style="list-style-type: none"> ESH

Home Energy Comparison Report NOVEMBER 2010



Whose electricity usage is being compared to mine?

869 Households Compared

- In the Greenville area
- Single family homes
- Non-electric heating
- 1300 - 1900 sq. ft.
- Built in 1963-1973

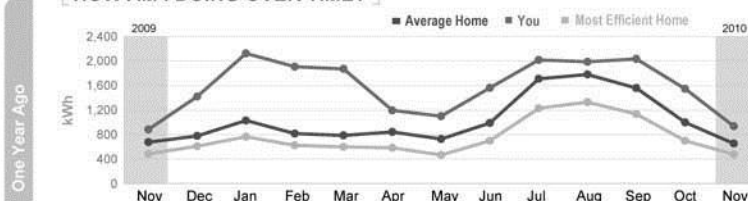
Account Number

HOW AM I DOING?



You have a little room to lower your costs. Looks like your monthly costs are slightly higher than similar homes. Try one of the tips below to see if you can lower your electric bill.

HOW AM I DOING OVER TIME?



About the same as last November. However, in the last 12 months, your home used 56% more energy than the average home.

Ah, football season!

Even if you're just "tailgating" around the television, you can still be festive... and energy smart. Try these tips:

- Lower your thermostat and encourage everyone to stay warm in their favorite **team sweatshirts** and hats.
- Keep drinks and snacks in **coolers** to avoid constantly opening the fridge.
- Use **insulated serving dishes** or carafes instead of leaving the oven and coffee pot on for hours.



FAST FACT

IN A FOG? Do you open a bath window in winter to clear foggy mirrors? Stop wasting energy and reduce moisture by installing a high efficiency fan in every bathroom.

Uncomfortable with your report? Fix the Leaks!

If your home was built before 1981, it is probably leaking air through gaps you'd never think about in your home's construction or ductwork. That's why we've developed a valuable service called **Energy Solutions @ Home®**.

Visit www.duke-energy.com/esh for more information.



QUESTIONS?
888-873-3853
M-F 8AM-5PM

OR
SaveEnergy@duke-energy.com

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Nov 24	Dec 10	CFL/ESH/Fog	SCWave7CFLESH	SCWave7CFLESH • Bathroom fan	SCWave7CFLESH • Free CFL • ESH

Whose electricity usage is being compared to mine?

388 Households Compared

- In the Gaffney area
- Single family homes
- Electric heating
- 1100 - 1700 sq. ft.
- Built in 1982-1992

Account Number

HOW AM I DOING?

HOME EFFICIENCY SCORE

*Using a scale of 0-100
Higher scores are better*

26

24

LAST QUARTER

25

FALL 2010

About the same. Let's see if you can add a few more points next quarter.

HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?

AVERAGE HOME

\$107

YOUR HOME

\$139

EFFICIENT HOME

\$81

You have a little room to lower your costs. Looks like your monthly costs are slightly higher than similar homes. Try one of the tips below to see if you can lower your electric bill.

QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com

Free and Easy!

CFL (Compact Fluorescent Light) bulbs burn cooler, use 75% less energy, and last 10x longer than incandescents. **Now they're FREE from Duke Energy!** Here are three easy ways to order yours today:

- Call 1-800-943-7585 and then press or say "1."
- Visit www.duke-energy.com/free-cfls.
- Log into your **Online Services** customer account.

FAST FACT

IN A FOG? Do you open a bath window in winter to clear foggy mirrors? Stop wasting energy and reduce moisture by installing a high efficiency fan in every bathroom.

Uncomfortable with your report?
Fix the Leaks!

If your home was built before 1981, it is probably leaking air through gaps you'd never think about in your home's construction or ductwork. That's why we've developed a valuable service called **Energy Solutions @ Home®**.

Visit www.duke-energy.com/esh for more information.

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November 8, 2011

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Dec 27	Jan 11	Thermostat Wars/ Drafty Windows	SCWave8DraftyWindows	SCWave8DraftyWindow ○ Shrink Wrap ○ Fix leaks ○ Space heater	

Home Energy Comparison Report DECEMBER 2010



Whose electricity usage is being compared to mine?

539 Households Compared

- In the Simpsonville area
- Single family homes
- Non-electric heating
- 1600 - 2200 sq. ft.
- Built in 1994-2004

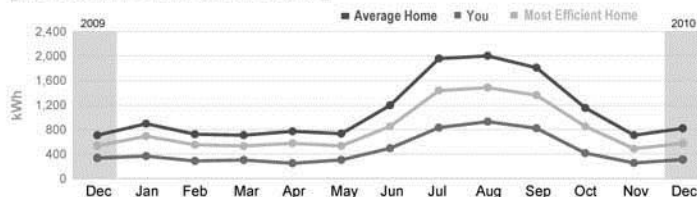
Account Number

HOW AM I DOING?



Keep it up! Share your success with others! Let us know how you manage your energy use using the contact information below!

HOW AM I DOING OVER TIME?



About the same as last December. In the last 12 months, your home used 59% less energy than the average home.

Wrap up savings.

Drafty windows can account for up to 30% of your heating bill. Seal them with a **"shrink wrap"** kit available at any hardware store. All you need is a **few minutes and a blow dryer**.

Winning the Thermostat Wars.

Is one person - or space - in your home always **colder than the others**? Quit fighting over the thermostat. A small, **efficient space heater** adds warmth only where it's needed, at a **fraction of the energy cost**.



QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR

SaveEnergy@duke-energy.com




FAST FACT A dripping faucet can leak **48 gallons** in a week... more than many water heaters hold! **Fix leaks quickly** - especially hot water leaks, which **waste water AND energy**.

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Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Dec 27	Jan 11	Thermostat Wars/ Dripping Faucet	SCWave8HeatPump	SCWave8HeatPump o Heat pump o Fix leaks o Space heater	

Home Energy Comparison Report
 DECEMBER 2010



Whose electricity usage is being compared to mine?

738 Households Compared


- In the Piedmont area
- Single family homes
- Non-electric heating
- 1600 - 2200 sq. ft.
- Built in 1963-1973

Account Number

HOW AM I DOING?

HOME EFFICIENCY SCORE

*Using a scale of 0-100
Higher scores are better*



59

69


LAST MONTH

80

LAST DECEMBER


Uh oh! Looks like your score dropped from last month and from last year.

HOW DID MY COSTS COMPARE TO SIMILAR HOMES THIS MONTH?




AVERAGE HOME

\$92



YOUR HOME

\$80



EFFICIENT HOME

\$63


Not bad. A few changes can make a world of difference. Try one of the tips below to improve your costs.

?

QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR
SaveEnergy@duke-energy.com

Are you paying too much at the pump?

If your heat pump is more than a **decade old**, odds are that you can replace it with **new technology** that is **20-40% more efficient**. Start shopping around now while Old Faithful still has some life left in it. Duke can help. Go to www.duke-energy.com/south-carolina/savings/smart-saver.asp to learn more about our equipment rebates.



FAST FACT

A dripping faucet can leak **48 gallons** in a week... more than many water heaters hold! **Fix leaks quickly** - especially hot water leaks, which **waste water AND energy**.

Winning the Thermostat Wars.

Is one person - or space - in your home always **colder than the others**? Quit fighting over the thermostat. A small, **efficient space heater** adds warmth only where it's needed, at a **fraction of the energy cost**.

Drop Date 1	Drop Date 2	Mailings	Name of PDF	Tip	Message
Jan 25		ESH/Share The Warmth/ Attic Insulation	SCWave9ESHShareTheWarmth	SCWave9ESHShareThe Warmth o Attic Insulation	SCWave9ESHShareThe Warmth o ESH o Share the Warmth

Home Energy Comparison Report JANUARY 2011



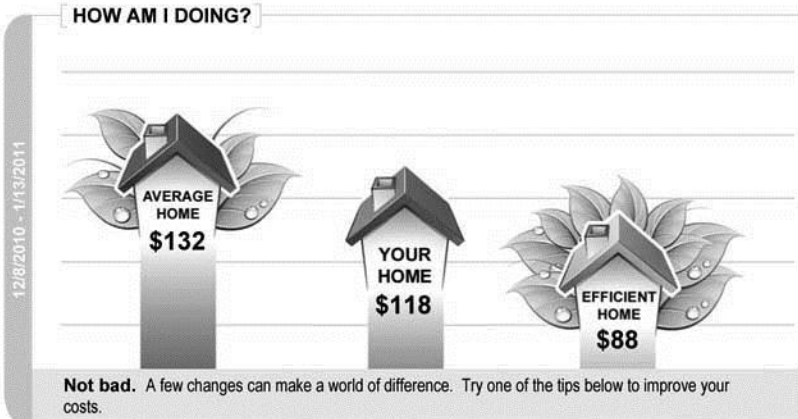
Whose electricity usage is being compared to mine?

599 Households Compared

- In the Amelia area
- Single family homes
- Non-electric heating
- 1700 - 2300 sq. ft.
- Built in 1993-2003

Account Number

HOW AM I DOING?



HOW AM I DOING OVER TIME?



The Resolution Solution

We can't help you get fit, find a new job, or clean out your garage. But our **Energy Solutions @ Home** experts can help you **whip your home - and energy bill - into shape.**

Our Energy Experts will work with you to **identify** hard-to-spot areas where your home may be **leaking air and money.** And our professionally installed improvements will **increase your comfort and save you money** for years to come.

Find out more by calling our **Energy Experts** at 888-873-3853.



FAST FACT Attic temperatures can range from 120 degrees in the summer to well below 0 in the winter. Adding 6" of insulation can save 10-40% of energy used by your heater or AC.

The Weather Outside's Still Frightful

The holidays may be over, but winter isn't. You can **help your neighbors** stay warm by giving one more very **special gift.** Contribute to our **Share The Warmth** program today, and we will match your **tax-deductible** donation dollar-for-dollar. That's a **very warm** feeling.

Learn more at www.duke-energy.com/community/programs/share-the-warmth.asp



QUESTIONS?
888-873-3853
M-F 8AM-5PM
OR

SaveEnergy@duke-energy.com

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Appendix K: List of Self-Reported Energy Efficiency Actions

16. Since January 2010, have you done anything else to save electricity in your home that was not included as a tip contained in the Home Energy Comparison Reports?

If yes, 16a. What have you done? Anything else?

- I installed CFLs in most of my lights. (N = 17)
- I replaced my HVAC unit with a more energy efficient model. (N = 16)
- I have lowered the thermostat in winter and use the AC less in summer. (N = 16)
- I have been reducing drafts. (N = 12)
- I added insulation. (N = 10)
- I have installed EE appliances. (N = 9)
- I have installed new windows. (N = 9)
- I am turning lights off more frequently. (N = 8)
- I have replaced storm doors. (N = 8)
- I am using less hot water. (N = 6)
- I have installed a new water heater. (N = 6)
- I have installed a new roof. (N = 5)
- I covered windows with plastic. (N = 3)
- I closed off unused rooms. (N = 2)
- I installed new siding. (N = 2)
- I use passive solar heating. (N = 2)
- I have installed heavy curtains. (N = 2)
- I air dry some laundry. 1
- I cook less. 1
- I cover the windows with drapes year round. 1
- I have cut down on the fans. 1
- I installed an attic vent fan. 1
- I installed vent covers to keep the cold out. 1
- I keep the garage door closed. 1
- I put a timer on the swimming pool filter to run during off-peak hours. 1
- I wash full loads of laundry. 1
- We do frequent maintenance checks. 1
- I turn off computers more often. 1

17. Have you done anything with the appliances in your home to save energy, such as removed second refrigerators or replaced old units?

If yes, 17a. What have you done? Anything else?

- I replaced the refrigerator with a more energy efficient model. (N = 29)
- I replaced the washer. (N = 25)
- I replaced the dryer. (N = 17)
- I got a new stove. (N = 10)
- I replaced the dishwasher with a more energy efficient model. (N = 9)

- I removed a refrigerator. (N = 6)
- I have installed more energy efficient appliances (N = 5)
- I unplug unused appliances. (N = 4)
- I installed an energy-efficient freezer. (N = 2)
- I replaced the microwave. (N = 2)
- I use the dishwasher less often. (N = 1)
- I use the microwave instead of the stove. (N = 1)
- I lowered the temperature in the refrigerator/freezer. (N = 1)
- I removed a freezer. (N = 1)
- I removed two window AC units. (N = 1)

18. Have you done anything that affected the cooling of your home?

If yes, 18a. What have you done? Anything else?

- I got a new AC unit. (N = 14)
- I had the HVAC system repaired (N = 12)
- I replaced the heat pump with an energy efficient model. (N = 12)
- I adjusted the thermostat to use less cooling and heating. (N = 7)
- I installed a programmable thermostat. (N = 6)
- I added weatherstripping. (N = 6)
- I close the blinds. (N = 5)
- I got a new roof. (N = 5)
- I installed a new HVAC unit. (N = 5)
- I added insulation. (N = 4)
- I closed off some rooms. (N = 4)
- I am changing filters more frequently. (N = 3)
- I installed thermal pane windows. (N = 3)
- I replaced doors. (N = 3)
- I installed ceiling fans. (N = 2)
- I installed some new portable AC units. (N = 2)
- I repaired the central air system. (N = 2)
- I had the roof repaired. (N = 1)
- I planted shade trees. (N = 1)
- I replaced vents underneath house. (N = 1)
- I got an attic fan. (N = 1)
- I had the whole house re-wired. (N = 1)

19. Have you done anything that affected the heating of your home?

If yes, 19a. What have you done? Anything else?

- I have adjusted the thermostat (N = 19)
- I installed a new heat pump. (N = 12)

- I have been reducing drafts (N = 10)
- I installed a new furnace. (N = 10)
- I closed off unused rooms. (N = 8)
- I had my HVAC serviced & repaired (N = 7)
- I use space heaters. (N = 7)
- I had the heat pump repaired. (N = 7)
- I am using the fireplace more. (N = 6)
- I replace furnace filters regularly. (N = 5)
- I added insulation. (N = 4)
- I installed a new HVAC (N = 4)
- I replaced windows. (N = 3)
- I installed a programmable thermostat. (N = 3)
- I use passive solar heat as much as possible. (N = 3)
- I use the wood stove for heating. (N = 2)
- I replaced doors. (N = 2)
- I cleaned and sealed the ducts. (N = 2)
- I turn off the heat pump. (N = 2)
- I installed a new roof. (N = 1)
- I had the whole house re-wired. (N = 1)
- I added a sunroom. (N = 1)

20. Have you done anything that affected the lighting in your home?

If yes, 20a. What have you done? Anything else?

- I am switching to CFLs. (N = 139)
- I have installed CFLs in all of my lights. (N = 29)
- I turn off lights. (N = 8)
- I used the coupon from Duke to get CFL bulbs. (N = 7)
- I installed a dimmer switch. (N = 1)
- I installed ambient lights. (N = 1)
- I put in fixtures that require fewer bulbs. (N = 1)
- I put in new outlets and electric switches. (N = 1)
- I replaced 5 switches. (N = 1)
- I replaced all the lights with energy efficient ones. Electrician said they're really dangerous (mercury). (N = 1)
- I use daylight instead of lamps. (N = 1)
- I use lights with sensors that shut them off automatically. (N = 1)

21. Have you done anything with home computers or electronics?

If yes, 21a. What have you done? Anything else?

- I turn off unused appliances and electronics. (N = 25)

- I unplug appliances. (N = 24)
- I bought a new more energy efficient computer. (N = 8)
- I purchased an HDTV. (N = 2)
- I stopped using my computer. (N = 2)
- I had the whole house re-wired. (N = 1)
- I installed energy efficient surge protectors. (N = 1)
- I removed the surround sound from my new TV. (N = 1)

22. Have you done anything to affect hot water heating in your home?

If yes, 22a. What have you done? Anything else?

- I installed a new water heater. (N = 22)
- I turned down the thermostat on the water heater. (N = 16)
- I wash full loads of laundry in cold water. (N = 7)
- I repaired the water heater. (N = 6)
- I insulated the water pipes. (N = 3)
- I try to use less hot water. (N = 3)
- I wrapped my water heater in an insulating blanket. (N = 3)

23a. Did you make any changes to your hot tub or pool's heating or filtering systems to make it more efficient?

If yes, 23b. What have you done? Anything else?

- "I installed a new energy efficient filtration system." (N = 4)
- "I do not heat the pool." (N = 3)
- "I installed a new efficient pool." (N = 2)
- "I installed a salt-generator to replace chlorine." (N = 2)
- "I installed insulation and a cover for the hot tub." (N = 2)
- "I lowered the temperature." (N = 2)

Appendix L: Estimated Billing Data Models

OVERALL

Fixed-effects (within) regression
Group variable: acct_id

Number of obs = 1029012
Number of groups = 35248

corr(u_i, Xb) = -0.0085

F(84,993680) = 6507.82
Prob > F = 0.0000

	kwhd	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
part		-.4025099	.0720646	-5.59	0.000	-.5437541	-.2612656
tme#c.hddd							
200901		.4977119	.0305352	16.30	0.000	.4378639	.5575599
200902		.3246368	.0438125	7.41	0.000	.2387658	.4105078
200903		.0876672	.0670656	1.31	0.191	-.0437791	.2191135
200904		.1123778	.0359429	3.13	0.002	.0419308	.1828248
200905		-.7641207	.1581212	-4.83	0.000	-1.074033	-.4542085
200906		3.180384	.5324077	5.97	0.000	2.136883	4.223886
200907		(empty)					
200908		(empty)					
200909		1.694174	1.024231	1.65	0.098	-.3132842	3.701631
200910		.0923183	.1018394	0.91	0.365	-.1072834	.2919201
200911		.0922806	.1099837	0.84	0.401	-.1232837	.3078448
200912		1.236954	.0182912	67.63	0.000	1.201104	1.272804
201001		.6959883	.0321054	21.68	0.000	.6330628	.7589137
201002		.5130409	.0578254	8.87	0.000	.399705	.6263768
201003		1.611536	.0329098	48.97	0.000	1.547034	1.676038
201004		.4716983	.037676	12.52	0.000	.3978546	.5455421
201005		-2.026604	.2211807	-9.16	0.000	-2.460111	-1.593098
201006		-5.091873	.3810604	-13.36	0.000	-5.838738	-4.345007
201007		(empty)					
201008		(empty)					
201009		1.229068	.7439166	1.65	0.099	-.228983	2.68712
201010		.0052254	.1635359	0.03	0.975	-.3152994	.3257502
201011		.8986025	.043499	20.66	0.000	.8133459	.983859
201012		1.338896	.0184368	72.62	0.000	1.302761	1.375032
201101		-.5703055	.0473865	-12.04	0.000	-.6631813	-.4774296
201102		1.116331	.0342407	32.60	0.000	1.04922	1.183441
201103		-.5081568	.0072521	-70.07	0.000	-.5223707	-.4939428
201104		-.657308	.0102555	-64.09	0.000	-.6774084	-.6372077
201105		-1.226845	.017419	-70.43	0.000	-1.260986	-1.192704
201106		-3.648097	.0357131	-102.15	0.000	-3.718094	-3.578101
tme#c.cddd							
200901		33.44604	16.38007	2.04	0.041	1.341647	65.55043
200902		-6.069074	5.562535	-1.09	0.275	-16.97145	4.833307
200903		-7.382328	.5392327	-13.69	0.000	-8.439206	-6.32545
200904		3.51711	.3928757	8.95	0.000	2.747087	4.287133
200905		.2192315	.2764534	0.79	0.428	-.3226079	.7610709
200906		2.481084	.0785988	31.57	0.000	2.327033	2.635135
200907		.523664	.0884484	5.92	0.000	.3503081	.6970199
200908		-.6738837	.0916465	-7.35	0.000	-.8535077	-.4942596
200909		1.327777	.0455464	29.15	0.000	1.238507	1.417046
200910		.6575484	.0949175	6.93	0.000	.4715133	.8435835
200911		-3.840955	.2928628	-13.12	0.000	-4.414957	-3.266954
200912		-13.38209	3.383388	-3.96	0.000	-20.01342	-6.750765
201001		(empty)					
201002		-30.76881	23.31849	-1.32	0.187	-76.47227	14.93466

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Appendices

201003		-14.09286	16.36556	-0.86	0.389	-46.16881	17.98308
201004		-1.043584	.3055897	-3.41	0.001	-1.642529	-.4446382
201005		1.405767	.1583561	8.88	0.000	1.095394	1.716139
201006		1.326775	.0578167	22.95	0.000	1.213456	1.440094
201007		1.681089	.0704143	23.87	0.000	1.543079	1.819098
201008		-1.086593	.0764474	-14.21	0.000	-1.236428	-.9367591
201009		.834181	.0434556	19.20	0.000	.7490095	.9193525
201010		1.005157	.0545583	18.42	0.000	.8982245	1.112089
201011		-.8278352	.3611735	-2.29	0.022	-1.535723	-.1199473
201012		-1.459046	.4832669	-3.02	0.003	-2.406233	-.5118593
201101		(empty)					
201102		154.5393	140.4707	1.10	0.271	-120.7785	429.8571
201103		-6.017929	.3314986	-18.15	0.000	-6.667655	-5.368203
201104		-3.308822	.1450645	-22.81	0.000	-3.593144	-3.024501
201105		-.2881187	.0730508	-3.94	0.000	-.4312958	-.1449416
201106		.1390401	.0232801	5.97	0.000	.0934118	.1846684
tme							
200902		5.592003	1.263574	4.43	0.000	3.115441	8.068564
200903		7.692406	1.530705	5.03	0.000	4.692276	10.69254
200904		-5.462864	.8049914	-6.79	0.000	-7.04062	-3.885108
200905		-1.789942	1.54274	-1.16	0.246	-4.813661	1.233777
200906		-17.73804	1.16641	-15.21	0.000	-20.02416	-15.45191
200907		9.069314	1.474306	6.15	0.000	6.179723	11.95891
200908		26.94059	1.540577	17.49	0.000	23.92111	29.96007
200909		-5.486779	.9146271	-6.00	0.000	-7.279418	-3.694141
200910		-5.408066	1.008203	-5.36	0.000	-7.384111	-3.432022
200911		-4.138799	1.201203	-3.45	0.001	-6.493117	-1.78448
200912		-16.91048	.7169163	-23.59	0.000	-18.31561	-15.50535
201001		1.14221	1.176613	0.97	0.332	-1.163911	3.448332
201002		6.833989	1.65325	4.13	0.000	3.593675	10.0743
201003		-25.16963	1.065744	-23.62	0.000	-27.25846	-23.08081
201004		-6.289875	.9496969	-6.62	0.000	-8.151249	-4.428501
201005		-2.811975	1.331518	-2.11	0.035	-5.421706	-.2022448
201006		-3.263804	.9675928	-3.37	0.001	-5.160253	-1.367354
201007		-7.562311	1.410022	-5.36	0.000	-10.32591	-4.798716
201008		46.07328	1.596663	28.86	0.000	42.94388	49.20269
201009		2.789444	.9819459	2.84	0.005	.8648629	4.714025
201010		-7.130797	.9143673	-7.80	0.000	-8.922926	-5.338668
201011		-10.89929	.9337135	-11.67	0.000	-12.72934	-9.069242
201012		-19.56546	.7645691	-25.59	0.000	-21.06399	-18.06693
201101		42.43843	1.584584	26.78	0.000	39.3327	45.54416
201102		-7.882922	1.070253	-7.37	0.000	-9.980581	-5.785263
201103		6.655394	.6827685	9.75	0.000	5.317191	7.993597
201104		4.333321	.7015766	6.18	0.000	2.958255	5.708388
201105		-1.245604	.7178742	-1.74	0.083	-2.652613	.1614051
201106		8.244717	.7138823	11.55	0.000	6.845532	9.643902
_cons		37.42695	.6573181	56.94	0.000	36.13863	38.71527

USAGE <20kwh/day

Fixed-effects (within) regression

Group variable: acct_id

Number of obs = 86648

Number of groups = 2977

F(80,83591) = 724.48

Prob > F = 0.0000

corr(u_i, Xb) = 0.0008

kwhd		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
part		-.1125358	.1048648	-1.07	0.283	-.31807 .0929985

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tme#c.hddd						
200901	.0223936	.043435	0.52	0.606	-.0627387	.107526
200902	.0953104	.0593936	1.60	0.109	-.0211006	.2117214
200903	-.0114375	.0957842	-0.12	0.905	-.1991738	.1762988
200904	.0626675	.0554681	1.13	0.259	-.0460496	.1713846
200905	-.2389428	.2167675	-1.10	0.270	-.6638054	.1859198
200906	.1648679	.7346011	0.22	0.822	-1.274945	1.604681
200909	1.035762	1.02482	1.01	0.312	-.9728775	3.044401
200910	.202708	.1465635	1.38	0.167	-.0845554	.4899713
200911	-.254179	.1548873	-1.64	0.101	-.5577568	.0493989
200912	.2350159	.026352	8.92	0.000	.1833662	.2866656
201001	.1319982	.0474961	2.78	0.005	.0389062	.2250902
201002	-.1233506	.0830499	-1.49	0.137	-.2861278	.0394265
201003	.2630161	.0458029	5.74	0.000	.1732427	.3527896
201004	.0603888	.0526904	1.15	0.252	-.0428839	.1636616
201005	-.7065137	.3132133	-2.26	0.024	-1.320409	-.0926181
201006	.4003051	.5663447	0.71	0.480	-.7097261	1.510336
201009	1.730207	2.607045	0.66	0.507	-3.379581	6.839995
201010	-.0902466	.1776966	-0.51	0.612	-.4385306	.2580374
201011	.2310537	.0580225	3.98	0.000	.1173302	.3447773
201012	.2510025	.0264513	9.49	0.000	.1991581	.3028469
201101	.0959695	.0673886	1.42	0.154	-.0361117	.2280506
201102	.3877099	.0479963	8.08	0.000	.2936376	.4817822
201103	-.137976	.0104802	-13.17	0.000	-.1585171	-.1174349
201104	-.1721147	.0151084	-11.39	0.000	-.2017271	-.1425023
201105	-.3348033	.0252226	-13.27	0.000	-.3842395	-.2853672
201106	-1.442353	.05195	-27.76	0.000	-1.544174	-1.340531
tme#c.cddd						
200903	-2.564261	.8908436	-2.88	0.004	-4.310307	-.8182141
200904	.9922749	.6325653	1.57	0.117	-.2475482	2.232098
200905	-.1429814	.3802998	-0.38	0.707	-.8883661	.6024033
200906	1.006959	.1149894	8.76	0.000	.7815805	1.232337
200907	.5920009	.1249263	4.74	0.000	.3471463	.8368555
200908	.252369	.1303365	1.94	0.053	-.0030896	.5078276
200909	1.010655	.0637698	15.85	0.000	.8856666	1.135643
200910	.5139814	.1442336	3.56	0.000	.2312847	.7966781
200911	-1.180792	.4355885	-2.71	0.007	-2.034542	-.3270419
200912	2.786784	4.850497	0.57	0.566	-6.720154	12.29372
201004	-.7762814	.4311454	-1.80	0.072	-1.621323	.0687602
201005	.3820597	.2189908	1.74	0.081	-.0471606	.81128
201006	1.228585	.0773124	15.89	0.000	1.077053	1.380117
201007	1.52296	.0971412	15.68	0.000	1.332564	1.713356
201008	.0542253	.1138962	0.48	0.634	-.1690103	.2774609
201009	.6847083	.0627953	10.90	0.000	.56163	.8077867
201010	.5859147	.0655512	8.94	0.000	.4574349	.7143946
201011	.5603165	.4730857	1.18	0.236	-.3669279	1.487561
201012	-.5770714	.767381	-0.75	0.452	-2.081132	.9269896
201102	80.21943	138.3934	0.58	0.562	-191.0306	351.4695
201103	-1.612874	.3977912	-4.05	0.000	-2.392542	-.8332062
201104	-1.056773	.1997698	-5.29	0.000	-1.44832	-.6652252
201105	-.0019772	.1001451	-0.02	0.984	-.1982609	.1943064
201106	.1267855	.0336584	3.77	0.000	.0608152	.1927557
tme						
200902	-1.951951	1.748923	-1.12	0.264	-5.379826	1.475924
200903	.0167523	2.216324	0.01	0.994	-4.327225	4.36073
200904	-3.784603	1.176478	-3.22	0.001	-6.09049	-1.478715
200905	-1.616135	2.13412	-0.76	0.449	-5.798995	2.566724
200906	-7.262761	1.687789	-4.30	0.000	-10.57081	-3.954708
200907	-.4544465	2.09428	-0.22	0.828	-4.559218	3.650325
200908	4.94081	2.192427	2.25	0.024	.6436706	9.23795
200909	-7.590748	1.293136	-5.87	0.000	-10.12528	-5.056211

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200910		-4.810864	1.477727	-3.26	0.001	-7.707197	-1.914532
200911		-.2012633	1.707612	-0.12	0.906	-3.548169	3.145642
200912		-4.923059	1.043217	-4.72	0.000	-6.967756	-2.878363
201001		-1.372469	1.742142	-0.79	0.431	-4.787055	2.042117
201002		5.460517	2.373036	2.30	0.021	.8093847	10.11165
201003		-5.468579	1.50037	-3.64	0.000	-8.409292	-2.527866
201004		-2.11443	1.340669	-1.58	0.115	-4.742131	.5132715
201005		-1.446164	1.877067	-0.77	0.441	-5.125202	2.232873
201006		-8.775777	1.352301	-6.49	0.000	-11.42628	-6.125277
201007		-13.69484	1.969859	-6.95	0.000	-17.55575	-9.833934
201008		15.01533	2.366181	6.35	0.000	10.37763	19.65302
201009		-1.345403	1.410534	-0.95	0.340	-4.11004	1.419233
201010		-3.016334	1.200252	-2.51	0.012	-5.368819	-.6638482
201011		-4.691925	1.284857	-3.65	0.000	-7.210235	-2.173615
201012		-4.336604	1.109204	-3.91	0.000	-6.510635	-2.162573
201101		1.66822	2.267788	0.74	0.462	-2.776628	6.113068
201102		-5.756351	1.509909	-3.81	0.000	-8.715762	-2.79694
201103		.3797184	.9861484	0.39	0.700	-1.553125	2.312562
201104		-.0602927	1.013268	-0.06	0.953	-2.04629	1.925704
201105		-1.680981	1.034595	-1.62	0.104	-3.708779	.3468175
201106		4.445814	1.036511	4.29	0.000	2.41426	6.477368
_cons		14.26023	.9502616	15.01	0.000	12.39773	16.12274

USAGE 20-30kwh/day

Fixed-effects (within) regression

Group variable: acct_id

Number of obs = 177490

Number of groups = 6073

corr(u_i, Xb) = -0.0064

F(82,171335) = 1403.39

Prob > F = 0.0000

kwhd		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]

part		-.0871268	.1074113	-0.81	0.417	-.2976505 .1233969

tme#c.hddd						
200901		.1416238	.0452616	3.13	0.002	.052912 .2303355
200902		.1026951	.0636968	1.61	0.107	-.0221492 .2275393
200903		-.2254677	.0994934	-2.27	0.023	-.4204726 -.0304628
200904		.0695775	.0554569	1.25	0.210	-.0391168 .1782718
200905		-.4880985	.2446027	-2.00	0.046	-.9675144 -.0086827
200906		2.041492	.7694252	2.65	0.008	.533436 3.549549
200909		1.140035	1.50142	0.76	0.448	-1.802716 4.082785
200910		.059471	.1481372	0.40	0.688	-.2308747 .3498166
200911		-.0588717	.1588832	-0.37	0.711	-.3702793 .2525358
200912		.4925372	.0275882	17.85	0.000	.4384649 .5466095
201001		.1305828	.0477983	2.73	0.006	.0368992 .2242664
201002		.2431256	.0838748	2.90	0.004	.0787329 .4075184
201003		.6947414	.0492889	14.10	0.000	.5981362 .7913465
201004		.2621409	.0562718	4.66	0.000	.1518495 .3724324
201005		-.6797639	.3377468	-2.01	0.044	-1.34174 -.0177876
201006		-2.010619	.575615	-3.49	0.000	-3.138812 -.8824264
201009		.9101569	.617487	1.47	0.140	-.300104 2.120418
201010		-.2268112	.2312644	-0.98	0.327	-.6800842 .2264619
201011		.3793865	.0621928	6.10	0.000	.2574899 .5012831
201012		.5915355	.0276392	21.40	0.000	.5373633 .6457077
201101		-.3665609	.0705959	-5.19	0.000	-.5049273 -.2281944
201102		.4802926	.0512023	9.38	0.000	.3799372 .5806481
201103		-.2625197	.0111395	-23.57	0.000	-.2843529 -.2406866
201104		-.3279427	.0160615	-20.42	0.000	-.3594228 -.2964625
201105		-.6656574	.0268523	-24.79	0.000	-.7182872 -.6130275

TecMarket Works

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201106	-2.373389	.0551109	-43.07	0.000	-2.481405	-2.265373
tme#c.cddd						
200902	5.127538	4.653225	1.10	0.270	-3.99268	14.24775
200903	-5.901564	.8887173	-6.64	0.000	-7.643431	-4.159698
200904	2.399951	.6653104	3.61	0.000	1.095957	3.703944
200905	-.098249	.4278873	-0.23	0.818	-.9368987	.7404007
200906	1.849938	.1184448	15.62	0.000	1.617789	2.082088
200907	.5413861	.126982	4.26	0.000	.2925042	.7902679
200908	.104781	.1345266	0.78	0.436	-.1588882	.3684502
200909	1.321156	.0685401	19.28	0.000	1.186819	1.455493
200910	.6299979	.1417993	4.44	0.000	.3520744	.9079213
200911	-1.799313	.4374292	-4.11	0.000	-2.656665	-.9419619
200912	-4.735782	4.961685	-0.95	0.340	-14.46057	4.989011
201003	-57.7651	96.17071	-0.60	0.548	-246.2575	130.7274
201004	-.179098	.4524872	-0.40	0.692	-1.065963	.7077668
201005	1.164337	.2441928	4.77	0.000	.6857242	1.642949
201006	1.285127	.0857847	14.98	0.000	1.116991	1.453263
201007	1.348847	.1075012	12.55	0.000	1.138147	1.559547
201008	-.118684	.1100794	-1.08	0.281	-.3344372	.0970691
201009	.9647566	.0656409	14.70	0.000	.8361019	1.093411
201010	.9010802	.0803422	11.22	0.000	.7436112	1.058549
201011	-.3510395	.5095561	-0.69	0.491	-1.349758	.6476792
201012	.2431675	.7349957	0.33	0.741	-1.197408	1.683743
201102	383.6082	129.1571	2.97	0.003	130.4631	636.7533
201103	-5.261574	.6668367	-7.89	0.000	-6.568559	-3.954589
201104	-1.735117	.2317307	-7.49	0.000	-2.189304	-1.28093
201105	-.0922903	.1118338	-0.83	0.409	-.311482	.1269014
201106	.2115647	.0353666	5.98	0.000	.1422469	.2808825
tme						
200902	1.014178	1.854988	0.55	0.585	-2.621557	4.649912
200903	6.952619	2.290361	3.04	0.002	2.463562	11.44168
200904	-4.558003	1.203133	-3.79	0.000	-6.916116	-2.19989
200905	-.9566037	2.369783	-0.40	0.686	-5.601325	3.688118
200906	-12.86221	1.737909	-7.40	0.000	-16.26847	-9.455948
200907	5.979476	2.12872	2.81	0.005	1.807232	10.15172
200908	12.52299	2.266613	5.52	0.000	8.080476	16.9655
200909	-7.486038	1.365562	-5.48	0.000	-10.16251	-4.809567
200910	-4.456907	1.49015	-2.99	0.003	-7.377567	-1.536246
200911	-2.289063	1.757713	-1.30	0.193	-5.734141	1.156014
200912	-7.949444	1.071124	-7.42	0.000	-10.04882	-5.850064
201001	3.980607	1.758954	2.26	0.024	.5330964	7.428117
201002	.5070204	2.405265	0.21	0.833	-4.207245	5.221286
201003	-12.59796	1.592281	-7.91	0.000	-15.7188	-9.477126
201004	-4.908936	1.411151	-3.48	0.001	-7.674762	-2.143111
201005	-4.25194	2.028811	-2.10	0.036	-8.228364	-.2755153
201006	-5.239833	1.435314	-3.65	0.000	-8.053018	-2.426649
201007	-4.464107	2.144295	-2.08	0.037	-8.666879	-.2613359
201008	24.76136	2.31277	10.71	0.000	20.22839	29.29434
201009	-1.04388	1.468999	-0.71	0.477	-3.923087	1.835326
201010	-4.247424	1.340993	-3.17	0.002	-6.87574	-1.619107
201011	-5.720395	1.35277	-4.23	0.000	-8.371795	-3.068996
201012	-9.633255	1.14116	-8.44	0.000	-11.8699	-7.396606
201101	21.24113	2.376443	8.94	0.000	16.58336	25.89891
201102	-4.396122	1.594882	-2.76	0.006	-7.522055	-1.270189
201103	2.40398	1.01662	2.36	0.018	.4114285	4.396532
201104	.9655113	1.050167	0.92	0.358	-1.092794	3.023816
201105	-1.146141	1.073109	-1.07	0.285	-3.24941	.9571275
201106	6.698185	1.065504	6.29	0.000	4.609821	8.786549
_cons	22.13517	.9775903	22.64	0.000	20.21912	24.05123

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USAGE 30-40kwh/day

Fixed-effects (within) regression

Group variable: acct_id

Number of obs = 232466

Number of groups = 7963

F(81,224422) = 1527.27

Prob > F = 0.0000

corr(u_i, Xb) = -0.0119

	kwhd	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
	part	-.4723227	.1274012	-3.71	0.000	-.7220258	-.2226196
tme#c.hddd							
	200901	.3036407	.0539754	5.63	0.000	.1978502	.4094312
	200902	.1749232	.0775635	2.26	0.024	.0229006	.3269457
	200903	-.0779857	.1210199	-0.64	0.519	-.3151816	.1592101
	200904	.1193575	.0644283	1.85	0.064	-.0069203	.2456352
	200905	-.5161496	.2830316	-1.82	0.068	-1.070884	.0385851
	200906	2.977293	.9349478	3.18	0.001	1.144819	4.809767
	200909	1.774803	1.081529	1.64	0.101	-.3449661	3.894572
	200910	.2354052	.1782798	1.32	0.187	-.1140188	.5848291
	200911	-.0151491	.1986755	-0.08	0.939	-.404548	.3742498
	200912	.8755055	.0321758	27.21	0.000	.8124417	.9385693
	201001	.3560419	.0571531	6.23	0.000	.2440232	.4680606
	201002	.6513225	.1005202	6.48	0.000	.4543054	.8483397
	201003	1.198523	.058208	20.59	0.000	1.084437	1.312609
	201004	.4156426	.0667026	6.23	0.000	.2849072	.546378
	201005	-1.461851	.3964962	-3.69	0.000	-2.238974	-.6847289
	201006	-4.999742	.6847778	-7.30	0.000	-6.341889	-3.657595
	201009	1.957613	1.771879	1.10	0.269	-1.515226	5.430451
	201010	-.1348962	.3079367	-0.44	0.661	-.7384443	.4686518
	201011	.6556614	.0757458	8.66	0.000	.5072015	.8041212
	201012	1.005224	.0323999	31.03	0.000	.9417208	1.068727
	201101	-.4353068	.0848299	-5.13	0.000	-.6015712	-.2690423
	201102	.8388776	.0612163	13.70	0.000	.7188953	.95886
	201103	-.388873	.0129752	-29.97	0.000	-.4143042	-.3634419
	201104	-.5414509	.018362	-29.49	0.000	-.57744	-.5054619
	201105	-.9434871	.0308892	-30.54	0.000	-1.004029	-.882945
	201106	-3.04721	.0638621	-47.72	0.000	-3.172378	-2.922042
tme#c.cddd							
	200902	8.418277	10.32848	0.82	0.415	-11.82528	28.66184
	200903	-8.166651	1.044435	-7.82	0.000	-10.21372	-6.119585
	200904	3.350691	.7282331	4.60	0.000	1.923373	4.778009
	200905	.3151561	.4963201	0.63	0.525	-.6576186	1.287931
	200906	2.391225	.1402777	17.05	0.000	2.116284	2.666166
	200907	.4590131	.1540896	2.98	0.003	.1570014	.7610248
	200908	-.4370358	.1603754	-2.73	0.006	-.7513676	-.1227041
	200909	1.205316	.0809119	14.90	0.000	1.046731	1.363901
	200910	.7937179	.1676774	4.73	0.000	.4650745	1.122361
	200911	-2.808057	.5249543	-5.35	0.000	-3.836954	-1.77916
	200912	-11.23171	6.258298	-1.79	0.073	-23.49782	1.034393
	201003	-16.73897	19.50637	-0.86	0.391	-54.97095	21.49301
	201004	-.7314309	.5359397	-1.36	0.172	-1.781859	.3189973
	201005	1.410255	.2862103	4.93	0.000	.84929	1.97122
	201006	1.214332	.1031207	11.78	0.000	1.012218	1.416446
	201007	1.676994	.1230834	13.62	0.000	1.435753	1.918234
	201008	-.5408547	.1297931	-4.17	0.000	-.7952458	-.2864635
	201009	.7547838	.076958	9.81	0.000	.603948	.9056196
	201010	.9254072	.1025151	9.03	0.000	.7244802	1.126334
	201011	-.5925216	.6363346	-0.93	0.352	-1.839721	.654678
	201012	-.1226372	.8657362	-0.14	0.887	-1.819458	1.574184

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201103	-2.058561	.6773663	-3.04	0.002	-3.386182	-.7309407
201104	-2.946981	.2687902	-10.96	0.000	-3.473803	-2.42016
201105	-.2575195	.1334457	-1.93	0.054	-.5190696	.0040306
201106	.2087774	.0418465	4.99	0.000	.1267592	.2907955
tme						
200902	3.871613	2.238287	1.73	0.084	-.5153714	8.258598
200903	7.420373	2.765579	2.68	0.007	1.999908	12.84084
200904	-6.179678	1.427055	-4.33	0.000	-8.976671	-3.382686
200905	-3.178642	2.759821	-1.15	0.249	-8.58782	2.230537
200906	-17.64057	2.068578	-8.53	0.000	-21.69493	-13.58621
200907	8.402315	2.577109	3.26	0.001	3.351248	13.45338
200908	21.99459	2.701577	8.14	0.000	16.69957	27.28961
200909	-5.192044	1.621098	-3.20	0.001	-8.369354	-2.014734
200910	-6.84641	1.776052	-3.85	0.000	-10.32743	-3.365393
200911	-3.789018	2.156853	-1.76	0.079	-8.016396	.4383596
200912	-13.02897	1.268585	-10.27	0.000	-15.51536	-10.54257
201001	4.404363	2.094925	2.10	0.036	.2983632	8.510362
201002	-3.425185	2.880477	-1.19	0.234	-9.070847	2.220478
201003	-20.21394	1.886013	-10.72	0.000	-23.91048	-16.5174
201004	-6.577693	1.679001	-3.92	0.000	-9.868492	-3.286893
201005	-4.176079	2.385596	-1.75	0.080	-8.851786	.4996281
201006	-2.89977	1.719217	-1.69	0.092	-6.269392	.4698523
201007	-8.981415	2.472782	-3.63	0.000	-13.82801	-4.134824
201008	34.22544	2.733343	12.52	0.000	28.86816	39.58273
201009	3.15502	1.736511	1.82	0.069	-.2484977	6.558537
201010	-5.872479	1.666272	-3.52	0.000	-9.138329	-2.606629
201011	-9.014774	1.642738	-5.49	0.000	-12.2345	-5.795049
201012	-15.64556	1.350728	-11.58	0.000	-18.29296	-12.99817
201101	31.01661	2.835291	10.94	0.000	25.45951	36.5737
201102	-7.15459	1.904444	-3.76	0.000	-10.88725	-3.421928
201103	3.712619	1.208771	3.07	0.002	1.34346	6.081779
201104	3.496042	1.244271	2.81	0.005	1.057302	5.934782
201105	-1.281888	1.275349	-1.01	0.315	-3.78154	1.217764
201106	7.173747	1.265892	5.67	0.000	4.692632	9.654862
_cons						
	30.89485	1.163789	26.55	0.000	28.61385	33.17585

USAGE 40-50kwh/day

Fixed-effects (within) regression

Group variable: acct_id

Number of obs = 210694

Number of groups = 7211

corr(u_i, Xb) = -0.0142

F(81,203402) = 1714.51

Prob > F = 0.0000

kwhd	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	

part	-.1448074	.1481334	-0.98	0.328	-.4351452	.1455304
tme#c.hddd						
200901	.4961697	.0622404	7.97	0.000	.37418	.6181594
200902	.4350119	.091189	4.77	0.000	.2562836	.6137402
200903	.4963091	.128312	3.87	0.000	.2448207	.7477976
200904	.2168206	.0722873	3.00	0.003	.0751392	.358502
200905	-.3853662	.3128075	-1.23	0.218	-.9984613	.2277289
200906	3.446522	1.108464	3.11	0.002	1.27396	5.619085
200909	-77.02472	30.83508	-2.50	0.012	-137.4607	-16.58871
200910	.3253097	.2102267	1.55	0.122	-.0867296	.737349
200911	.0916649	.2191605	0.42	0.676	-.3378843	.5212141
200912	1.274779	.0374225	34.06	0.000	1.201432	1.348126
201001	.8762552	.0647699	13.53	0.000	.7493078	1.003202

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201002		.2712193	.1187458	2.28	0.022	.0384804	.5039581
201003		1.741058	.0679054	25.64	0.000	1.607965	1.874151
201004		.6201183	.0770256	8.05	0.000	.4691501	.7710865
201005		-1.886662	.4502607	-4.19	0.000	-2.769162	-1.004162
201006		-4.467911	.7817376	-5.72	0.000	-6.000098	-2.935724
201009		-2.590533	3.934462	-0.66	0.510	-10.30198	5.120917
201010		.0659259	.3834604	0.17	0.863	-.6856472	.817499
201011		.7705088	.0926203	8.32	0.000	.5889753	.9520423
201012		1.384929	.0377502	36.69	0.000	1.31094	1.458919
201101		-.5820162	.0967278	-6.02	0.000	-.7716003	-.3924321
201102		1.020802	.0698356	14.62	0.000	.8839264	1.157679
201103		-1.5074026	.0149062	-34.04	0.000	-.5366183	-.4781868
201104		-.6716987	.0210009	-31.98	0.000	-.71286	-.6305374
201105		-1.263926	.0361788	-34.94	0.000	-1.334836	-1.193017
201106		-3.908992	.0754017	-51.84	0.000	-4.056778	-3.761207
tme#c.dddd							
200902		-128.2438	30.8352	-4.16	0.000	-188.6801	-67.80759
200903		-3.275527	.8512779	-3.85	0.000	-4.944011	-1.607043
200904		3.169084	.6800916	4.66	0.000	1.836121	4.502047
200905		.7295671	.5444819	1.34	0.180	-.3376042	1.796738
200906		2.474191	.1600584	15.46	0.000	2.160481	2.787902
200907		-.0086901	.1830825	-0.05	0.962	-.3675274	.3501472
200908		-1.345907	.1886289	-7.14	0.000	-1.715615	-.9761988
200909		1.366763	.0927663	14.73	0.000	1.184943	1.548583
200910		.9784593	.1927871	5.08	0.000	.6006012	1.356317
200911		-3.176677	.5845272	-5.43	0.000	-4.322336	-2.031017
200912		-14.79402	6.724026	-2.20	0.028	-27.97294	-1.615089
201004		-.4970792	.6218884	-0.80	0.424	-1.715965	.721807
201005		1.417377	.3210588	4.41	0.000	.7881096	2.046645
201006		1.315121	.1200431	10.96	0.000	1.07984	1.550403
201007		1.467768	.1440312	10.19	0.000	1.18547	1.750066
201008		-1.470453	.1603709	-9.17	0.000	-1.784776	-1.15613
201009		.7081995	.0895005	7.91	0.000	.5327806	.8836183
201010		1.107819	.1234149	8.98	0.000	.8659286	1.349709
201011		-1.183713	.7822506	-1.51	0.130	-2.716905	.3494793
201012		-1.101009	.9811046	-1.12	0.262	-3.02395	.8219318
201102		-3.915392	216.4967	-0.02	0.986	-428.2437	420.4129
201103		-5.934387	.5938973	-9.99	0.000	-7.098411	-4.770363
201104		-3.695908	.2962693	-12.47	0.000	-4.276589	-3.115228
201105		-.5737868	.1511495	-3.80	0.000	-.8700362	-.2775375
201106		-.0422118	.047811	-0.88	0.377	-.1359203	.0514967
tme							
200902		3.125133	2.608812	1.20	0.231	-1.988074	8.238341
200903		-1.300849	2.940639	-0.44	0.658	-7.06443	4.462731
200904		-7.512675	1.639494	-4.58	0.000	-10.72604	-4.299307
200905		-5.860853	3.060654	-1.91	0.056	-11.85966	.1379544
200906		-19.00829	2.382465	-7.98	0.000	-23.67786	-14.33871
200907		15.91034	3.041347	5.23	0.000	9.949379	21.87131
200908		35.95503	3.166798	11.35	0.000	29.74818	42.16187
200909		-7.212363	1.863843	-3.87	0.000	-10.86545	-3.559275
200910		-9.127828	2.058332	-4.43	0.000	-13.16211	-5.093548
200911		-5.567014	2.404358	-2.32	0.021	-10.2795	-.8545308
200912		-17.82492	1.457936	-12.23	0.000	-20.68244	-14.9674
201001		-3.628395	2.372116	-1.53	0.126	-8.277685	1.020895
201002		13.90649	3.391183	4.10	0.000	7.259854	20.55313
201003		-27.92017	2.186002	-12.77	0.000	-32.20468	-23.63566
201004		-9.197336	1.93724	-4.75	0.000	-12.99428	-5.400394
201005		-4.306086	2.708103	-1.59	0.112	-9.613901	1.001729
201006		-4.329023	1.99118	-2.17	0.030	-8.231688	-.4263582
201007		-4.924305	2.877662	-1.71	0.087	-10.56445	.715842
201008		52.23508	3.334565	15.66	0.000	45.69941	58.77074

TecMarket Works

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201009		3.704017	2.01326	1.84	0.066	-.2419226	7.649957
201010		-9.162577	1.976329	-4.64	0.000	-13.03613	-5.28902
201011		-10.61148	1.960432	-5.41	0.000	-14.45388	-6.769084
201012		-20.40037	1.555864	-13.11	0.000	-23.44983	-17.35092
201101		44.01811	3.227548	13.64	0.000	37.6922	50.34402
201102		-4.88683	2.180757	-2.24	0.025	-9.16106	-.6126002
201103		5.890471	1.38928	4.24	0.000	3.167517	8.613425
201104		4.014371	1.428135	2.81	0.005	1.215262	6.81348
201105		-1.013554	1.463965	-0.69	0.489	-3.88289	1.855782
201106		10.19056	1.454342	7.01	0.000	7.340084	13.04103
<hr/>							
_cons		39.64103	1.336041	29.67	0.000	37.02242	42.25963

USAGE 50-60kwh/day

Fixed-effects (within) regression

Group variable: acct_id

Number of obs = 147199

Number of groups = 5049

corr(u_i, Xb) = -0.0084

F(83,142067) = 1401.37

Prob > F = 0.0000

<hr/>						
kwhd		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
<hr/>						
part		-.6383727	.2008	-3.18	0.001	-1.031937 - .2448085
<hr/>						
tme#c.hddd						
200901		.7092971	.0860562	8.24	0.000	.5406287 .87779656
200902		.6073743	.1237844	4.91	0.000	.3647592 .8499893
200903		.3906028	.1976567	1.98	0.048	.0031995 .778006
200904		.4416325	.096753	4.56	0.000	.2519985 .6312666
200905		-.7613315	.4646093	-1.64	0.101	-1.671957 .1492938
200906		1.422581	1.515354	0.94	0.348	-1.547484 4.392645
200909		-5.310497	12.10485	-0.44	0.661	-29.03577 18.41478
200910		.2477058	.2862152	0.87	0.387	-.3132705 .8086821
200911		-.0072516	.3150499	-0.02	0.982	-.6247433 .61024
200912		1.664811	.0511912	32.52	0.000	1.564477 1.765145
201001		1.18558	.0888905	13.34	0.000	1.011356 1.359803
201002		.8634292	.1615492	5.34	0.000	.5467958 1.180063
201003		2.357802	.0915662	25.75	0.000	2.178334 2.53727
201004		.7388032	.1042545	7.09	0.000	.5344664 .9431399
201005		-2.133288	.6334559	-3.37	0.001	-3.37485 -.891727
201006		-5.548942	1.048927	-5.29	0.000	-7.604819 -3.493065
201009		-6.467557	3.2792	-1.97	0.049	-12.89473 -.0403892
201010		.1617031	.4871356	0.33	0.740	-.7930733 1.11648
201011		.9380534	.1266281	7.41	0.000	.6898647 1.186242
201012		1.810656	.0514989	35.16	0.000	1.70972 1.911593
201101		.0237278	.1311878	0.18	0.856	-.2333978 .2808535
201102		1.602565	.0951379	16.84	0.000	1.416096 1.789033
201103		-.6762829	.0192551	-35.12	0.000	-.7140225 -.6385434
201104		-.7789539	.0268313	-29.03	0.000	-.8315428 -.7263651
201105		-1.469035	.0457976	-32.08	0.000	-1.558797 -1.379272
201106		-3.998479	.0921149	-43.41	0.000	-4.179023 -3.817936
<hr/>						
tme#c.cddd						
200901		48.55371	54.10864	0.90	0.370	-57.49818 154.6056
200902		-12.69759	16.18089	-0.78	0.433	-44.41183 19.01665
200903		-9.216503	1.670278	-5.52	0.000	-12.49021 -5.94279
200904		5.015902	1.099633	4.56	0.000	2.860641 7.171162
200905		.0944723	.8206527	0.12	0.908	-1.513991 1.702936
200906		2.369921	.2183834	10.85	0.000	1.941894 2.797949
200907		.2537136	.2481628	1.02	0.307	-.2326807 .7401079
200908		-1.235256	.2536942	-4.87	0.000	-1.732492 -.7380202

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200909		1.479428	.1278213	11.57	0.000	1.228901	1.729955
200910		1.047064	.2629764	3.98	0.000	.5316352	1.562493
200911		-3.781761	.8158389	-4.64	0.000	-5.380789	-2.182732
200912		-17.87591	9.687425	-1.85	0.065	-36.86308	1.111256
201002		-35.45704	24.65914	-1.44	0.150	-83.78848	12.8744
201003		-10.94058	24.41271	-0.45	0.654	-58.78902	36.90785
201004		-1.766015	.8589036	-2.06	0.040	-3.449449	-.0825801
201005		1.658276	.4549604	3.64	0.000	.7665628	2.54999
201006		1.411669	.1640573	8.60	0.000	1.09012	1.733218
201007		1.448369	.1980621	7.31	0.000	1.060172	1.836567
201008		-1.790943	.216289	-8.28	0.000	-2.214865	-1.36702
201009		.9509684	.1221651	7.78	0.000	.7115271	1.19041
201010		1.278518	.1559861	8.20	0.000	.9727887	1.584248
201011		-1.819432	1.037702	-1.75	0.080	-3.853307	.2144433
201012		-1.271708	1.302967	-0.98	0.329	-3.825499	1.282082
201103		-11.96106	.9911837	-12.07	0.000	-13.90376	-10.01836
201104		-4.741603	.3885486	-12.20	0.000	-5.503151	-3.980055
201105		-1.18981	.1950287	-6.10	0.000	-1.572063	-.8075578
201106		-.0699905	.062606	-1.12	0.264	-.1926971	.0527161
tme							
200902		4.911249	3.560761	1.38	0.168	-2.067773	11.89027
200903		6.11995	4.47626	1.37	0.172	-2.653433	14.89333
200904		-10.34094	2.235401	-4.63	0.000	-14.72228	-5.959597
200905		-2.636445	4.521433	-0.58	0.560	-11.49837	6.225477
200906		-15.75688	3.26589	-4.82	0.000	-22.15796	-9.355798
200907		14.16279	4.132511	3.43	0.001	6.063148	22.26243
200908		36.20362	4.277291	8.46	0.000	27.82021	44.58702
200909		-7.184656	2.572091	-2.79	0.005	-12.2259	-2.143407
200910		-9.250583	2.819572	-3.28	0.001	-14.77689	-3.724277
200911		-4.972107	3.414125	-1.46	0.145	-11.66373	1.719512
200912		-21.88065	2.003559	-10.92	0.000	-25.80759	-17.95371
201001		-4.597346	3.262475	-1.41	0.159	-10.99173	1.797042
201002		6.323746	4.628321	1.37	0.172	-2.747674	15.39517
201003		-37.27139	2.980043	-12.51	0.000	-43.11222	-31.43057
201004		-9.122833	2.656281	-3.43	0.001	-14.32909	-3.916574
201005		-5.098244	3.799532	-1.34	0.180	-12.54525	2.348766
201006		-3.940635	2.728651	-1.44	0.149	-9.288739	1.407469
201007		-2.325528	3.958666	-0.59	0.557	-10.08444	5.43338
201008		60.30109	4.508036	13.38	0.000	51.46543	69.13675
201009		1.070484	2.76522	0.39	0.699	-4.349293	6.490262
201010		-11.45239	2.609605	-4.39	0.000	-16.56717	-6.337613
201011		-11.875	2.663895	-4.46	0.000	-17.09619	-6.653819
201012		-25.57902	2.137604	-11.97	0.000	-29.76868	-21.38935
201101		34.33756	4.382756	7.83	0.000	25.74745	42.92768
201102		-11.92649	2.988995	-3.99	0.000	-17.78486	-6.068114
201103		10.27574	1.9132	5.37	0.000	6.525908	14.02558
201104		5.047712	1.959315	2.58	0.010	1.207493	8.887931
201105		.5344019	1.999437	0.27	0.789	-3.384457	4.453261
201106		9.382161	1.988931	4.72	0.000	5.483894	13.28043
_cons		47.60165	1.843954	25.81	0.000	43.98753	51.21576

USAGE 60-70kwh/day

Fixed-effects (within) regression

Group variable: acct_id

Number of obs = 84292

Number of groups = 2889

F(79,81324) = 929.39

corr(u_i, Xb) = -0.0156

Prob > F = 0.0000

kwhd		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
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TecMarket Works

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part	-.437673	.2929335	-1.49	0.135	-1.011821	.1364747
tme#c.hddd						
200901	1.175785	.1277401	9.20	0.000	.9254149	1.426154
200902	1.031044	.1850557	5.57	0.000	.6683365	1.393752
200903	.0904745	.2980266	0.30	0.761	-.4936556	.6746046
200904	.2236906	.1442852	1.55	0.121	-.0591075	.5064887
200905	-1.337429	.5936452	-2.25	0.024	-2.50097	-.1738886
200906	2.767192	2.292854	1.21	0.227	-1.726786	7.261169
200910	.091472	.4280797	0.21	0.831	-.7475613	.9305054
200911	.4584022	.4623491	0.99	0.321	-.4477989	1.364603
200912	2.155201	.0765098	28.17	0.000	2.005243	2.30516
201001	1.864764	.1318978	14.14	0.000	1.606245	2.123282
201002	.9778141	.2427016	4.03	0.000	.5021207	1.453507
201003	2.612811	.136889	19.09	0.000	2.344509	2.881112
201004	.9061747	.1565107	5.79	0.000	.5994148	1.212935
201005	-3.548458	.8931675	-3.97	0.000	-5.29906	-1.797855
201006	-7.503773	1.540402	-4.87	0.000	-10.52295	-4.484595
201009	4.476502	1.985451	2.25	0.024	.5850311	8.367973
201010	.0919454	.8103751	0.11	0.910	-1.496384	1.680275
201011	1.239974	.1878959	6.60	0.000	.8716996	1.608249
201012	2.36985	.0768871	30.82	0.000	2.219151	2.520548
201101	.0150729	.1949052	0.08	0.938	-.3669398	.3970857
201102	1.430158	.1420593	10.07	0.000	1.151723	1.708593
201103	-.7823277	.0300285	-26.05	0.000	-.8411833	-.7234722
201104	-.9754705	.0425087	-22.95	0.000	-1.058787	-.8921537
201105	-1.84023	.0747726	-24.61	0.000	-1.986784	-1.693677
201106	-5.199525	.1550272	-33.54	0.000	-5.503378	-4.895673
tme#c.cddd						
200902	-94.88978	27.68094	-3.43	0.001	-149.1442	-40.63532
200903	-11.73074	2.409269	-4.87	0.000	-16.45289	-7.008586
200904	7.167194	1.514583	4.73	0.000	4.198622	10.13577
200905	-.5854099	1.028685	-0.57	0.569	-2.601626	1.430806
200906	2.638468	.3209215	8.22	0.000	2.009465	3.267472
200907	.900307	.3786502	2.38	0.017	.1581552	1.642459
200908	-1.943709	.3903051	-4.98	0.000	-2.708704	-1.178714
200909	1.8852	.189045	9.97	0.000	1.514673	2.255727
200910	1.165421	.3888187	3.00	0.003	.4033386	1.927503
200911	-3.955799	1.197276	-3.30	0.001	-6.302452	-1.609146
200912	-30.73399	13.93307	-2.21	0.027	-58.04272	-3.425262
201004	-1.382021	1.274388	-1.08	0.278	-3.879813	1.115772
201005	1.207033	.6449086	1.87	0.061	-.0569829	2.47105
201006	1.24853	.2405682	5.19	0.000	.7770183	1.720042
201007	1.619171	.2829029	5.72	0.000	1.064683	2.173658
201008	-2.358372	.3182661	-7.41	0.000	-2.982171	-1.734572
201009	1.143085	.1801167	6.35	0.000	.7900575	1.496112
201010	1.376107	.2525467	5.45	0.000	.8811176	1.871097
201011	-1.476921	1.542816	-0.96	0.338	-4.500829	1.546987
201012	-.0927925	1.94107	-0.05	0.962	-3.897277	3.711692
201103	-5.252291	.9621675	-5.46	0.000	-7.138133	-3.366449
201104	-5.19777	.5494124	-9.46	0.000	-6.274615	-4.120925
201105	-1.278347	.2979571	-4.29	0.000	-1.862341	-.6943529
201106	-.0168502	.094091	-0.18	0.858	-.201268	.1675676
tme						
200902	5.966308	5.299919	1.13	0.260	-4.421497	16.35411
200903	21.58316	6.702031	3.22	0.001	8.447224	34.71909
200904	-2.195518	3.32657	-0.66	0.509	-8.715573	4.324537
200905	7.070324	5.883586	1.20	0.229	-4.461464	18.60211
200906	-11.67582	4.839635	-2.41	0.016	-21.16147	-2.190166
200907	12.95023	6.281126	2.06	0.039	.6392617	25.26119

TecMarket Works

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200908		55.48076	6.539125	8.48	0.000	42.66412	68.2974
200909		-4.350017	3.811255	-1.14	0.254	-11.82005	3.120016
200910		-3.247563	4.187639	-0.78	0.438	-11.45531	4.96018
200911		-2.808744	5.014274	-0.56	0.575	-12.63669	7.019199
200912		-21.56447	2.974118	-7.25	0.000	-27.39372	-15.73521
201001		-12.06619	4.828431	-2.50	0.012	-21.52988	-2.602493
201002		15.886	6.935276	2.29	0.022	2.292908	29.4791
201003		-32.66166	4.435522	-7.36	0.000	-41.35526	-23.96807
201004		-5.233854	3.957291	-1.32	0.186	-12.99012	2.52241
201005		6.052543	5.418321	1.12	0.264	-4.56733	16.67242
201006		5.640717	4.017979	1.40	0.160	-2.234494	13.51593
201007		3.135675	5.697732	0.55	0.582	-8.031842	14.30319
201008		79.75304	6.642121	12.01	0.000	66.73453	92.77155
201009		5.530296	4.087846	1.35	0.176	-2.481855	13.54245
201010		-6.645449	4.068441	-1.63	0.102	-14.61957	1.328667
201011		-8.9744	3.950867	-2.27	0.023	-16.71807	-1.230728
201012		-28.30058	3.17281	-8.92	0.000	-34.51927	-22.0819
201101		48.03199	6.495296	7.39	0.000	35.30125	60.76272
201102		3.148512	4.459379	0.71	0.480	-5.591841	11.88886
201103		16.53453	2.833891	5.83	0.000	10.98012	22.08894
201104		12.66266	2.89983	4.37	0.000	6.979009	18.3463
201105		6.508632	2.969256	2.19	0.028	.6889104	12.32835
201106		16.31849	2.952165	5.53	0.000	10.53227	22.10472
_cons		49.52757	2.731596	18.13	0.000	44.17366	54.88148

USAGE 70-80kwh/day

Fixed-effects (within) regression

Group variable: acct_id

Number of obs = 43406

Number of groups = 1487

corr(u_i, Xb) = -0.0102

F(80,41839) = 526.54

Prob > F = 0.0000

kwhd		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
part		-.6161847	.4431628	-1.39	0.164	-1.484793 .2524236
tme#c.hddd						
200901		.7891708	.1913519	4.12	0.000	.4141171 1.164224
200902		.6603483	.2829034	2.33	0.020	.1058517 1.214845
200903		.2646298	.4768592	0.55	0.579	-.6700241 1.199284
200904		.4728075	.2179974	2.17	0.030	.0455281 .9000869
200905		-.5016029	1.065171	-0.47	0.638	-2.589361 1.586155
200906		4.250579	3.445224	1.23	0.217	-2.502132 11.00329
200910		-.3686374	.6549844	-0.56	0.574	-1.65242 .9151457
200911		.3632399	.7034646	0.52	0.606	-1.015565 1.742045
200912		2.358176	.1135048	20.78	0.000	2.135705 2.580648
201001		1.559536	.1955435	7.98	0.000	1.176267 1.942805
201002		1.187841	.374442	3.17	0.002	.4539266 1.921755
201003		2.992567	.2059874	14.53	0.000	2.588828 3.396307
201004		1.109412	.245339	4.52	0.000	.6285425 1.590281
201005		-4.127592	1.233277	-3.35	0.001	-6.544839 -1.710344
201006		-9.55776	2.290958	-4.17	0.000	-14.04809 -5.067434
201009		-265.5535	151.4493	-1.75	0.080	-562.3973 31.29027
201010		.69732	.7462109	0.93	0.350	-.7652688 2.159909
201011		1.350169	.2744911	4.92	0.000	.8121609 1.888177
201012		2.630255	.1142145	23.03	0.000	2.406392 2.854117
201101		.191152	.3114724	0.61	0.539	-.4193403 .8016443
201102		2.11582	.2180196	9.70	0.000	1.688497 2.543143
201103		-.8566403	.0429973	-19.92	0.000	-.9409159 -.7723648
201104		-1.081034	.0609633	-17.73	0.000	-1.200523 -.9615445

TecMarket Works

Appendices

201105	-2.010352	.103746	-19.38	0.000	-2.213696	-1.807007
201106	-5.380496	.2141514	-25.12	0.000	-5.800237	-4.960754
tme#c.cddd						
200901	31.46439	42.27603	0.74	0.457	-51.39751	114.3263
200902	20.86788	42.38926	0.49	0.623	-62.21596	103.9517
200903	-12.89666	3.738232	-3.45	0.001	-20.22367	-5.569652
200904	10.23115	2.724569	3.76	0.000	4.890937	15.57136
200905	1.177609	1.85355	0.64	0.525	-2.455388	4.810605
200906	3.277133	.4791697	6.84	0.000	2.337951	4.216316
200907	.2711359	.5718722	0.47	0.635	-.8497453	1.392017
200908	-.7317269	.5781306	-1.27	0.206	-1.864875	.401421
200909	2.021367	.2860893	7.07	0.000	1.460626	2.582109
200910	.9509443	.5849554	1.63	0.104	-.1955803	2.097469
200911	-4.370979	1.824131	-2.40	0.017	-7.946314	-.7956436
200912	-29.31622	19.51548	-1.50	0.133	-67.56696	8.934516
201004	-1.834827	1.983745	-0.92	0.355	-5.723008	2.053354
201005	.8970417	.8400558	1.07	0.286	-.7494851	2.543568
201006	1.015259	.3677076	2.76	0.006	.2945441	1.735973
201007	2.196152	.4380147	5.01	0.000	1.337634	3.05467
201008	-3.113103	.5062031	-6.15	0.000	-4.105271	-2.120935
201009	1.296706	.265651	4.88	0.000	.776025	1.817388
201010	1.744776	.2694091	6.48	0.000	1.216728	2.272823
201011	-1.018893	2.248799	-0.45	0.650	-5.426586	3.388799
201012	1.158952	2.797981	0.41	0.679	-4.325148	6.643053
201103	-21.95714	2.617885	-8.39	0.000	-27.08824	-16.82603
201104	-7.879858	.9286117	-8.49	0.000	-9.699956	-6.05976
201105	-1.498812	.4601062	-3.26	0.001	-2.400629	-.596994
201106	-.0760298	.1402687	-0.54	0.588	-.3509593	.1988998
tme						
200902	7.31277	8.064046	0.91	0.364	-8.492927	23.11847
200903	9.821005	10.5951	0.93	0.354	-10.94561	30.58762
200904	-17.66203	4.970802	-3.55	0.000	-27.40491	-7.919158
200905	-12.69029	10.24659	-1.24	0.216	-32.77382	7.39324
200906	-27.8999	7.231214	-3.86	0.000	-42.07323	-13.72657
200907	14.17903	9.432583	1.50	0.133	-4.309028	32.66709
200908	28.5346	9.679198	2.95	0.003	9.563173	47.50603
200909	-14.35694	5.745301	-2.50	0.012	-25.61785	-3.096029
200910	-11.7685	6.327532	-1.86	0.063	-24.1706	.6335918
200911	-14.52447	7.611826	-1.91	0.056	-29.44381	.3948656
200912	-35.54096	4.415849	-8.05	0.000	-44.19612	-26.88581
201001	-8.724714	7.144198	-1.22	0.222	-22.72749	5.278063
201002	4.201582	10.67039	0.39	0.694	-16.7126	25.11577
201003	-49.59513	6.674791	-7.43	0.000	-62.67786	-36.5124
201004	-18.68164	6.076794	-3.07	0.002	-30.59228	-6.771
201005	-3.270406	7.522134	-0.43	0.664	-18.01394	11.47313
201006	-1.222921	6.054002	-0.20	0.840	-13.08889	10.64305
201007	-15.45538	8.728437	-1.77	0.077	-32.56329	1.652539
201008	86.27051	10.42503	8.28	0.000	65.83723	106.7038
201009	-5.349838	6.093474	-0.88	0.380	-17.29317	6.593498
201010	-21.86828	5.134465	-4.26	0.000	-31.93193	-11.80462
201011	-23.38049	5.836436	-4.01	0.000	-34.82003	-11.94096
201012	-44.17514	4.719265	-9.36	0.000	-53.425	-34.92529
201101	36.94337	10.24139	3.61	0.000	16.87003	57.0167
201102	-20.18614	6.800908	-2.97	0.003	-33.51606	-6.856216
201103	7.723424	4.220361	1.83	0.067	-.5485712	15.99542
201104	3.403218	4.329218	0.79	0.432	-5.082139	11.88858
201105	-5.006941	4.424724	-1.13	0.258	-13.67949	3.665609
201106	5.663366	4.380502	1.29	0.196	-2.922507	14.24924
_cons	69.37349	4.073135	17.03	0.000	61.39006	77.35692

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Appendices

USAGE 80-90kwh/day

Fixed-effects (within) regression

Group variable: acct_id

Number of obs = 21755

Number of groups = 745

F(78,20932) = 248.35

Prob > F = 0.0000

corr(u_i, Xb) = -0.0067

	kwhd	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
	part	-.788045	.7257725	-1.09	0.278	-2.210615	.6345252
tme#c.hddd							
	200901	1.998534	.3057462	6.54	0.000	1.399248	2.59782
	200902	1.309255	.457211	2.86	0.004	.4130864	2.205424
	200903	1.542595	.7583668	2.03	0.042	.056137	3.029052
	200904	.2378667	.3731132	0.64	0.524	-.493464	.9691973
	200905	-1.641736	1.566558	-1.05	0.295	-4.712311	1.428839
	200906	-3.043866	5.660421	-0.54	0.591	-14.13873	8.050997
	200910	1.020225	1.114066	0.92	0.360	-1.16343	3.20388
	200911	.5390812	1.177953	0.46	0.647	-1.769798	2.84796
	200912	2.74815	.1789428	15.36	0.000	2.397409	3.098892
	201001	2.941167	.3414698	8.61	0.000	2.27186	3.610474
	201002	1.885696	.6405858	2.94	0.003	.6300986	3.141294
	201003	3.242422	.3271178	9.91	0.000	2.601246	3.883598
	201004	1.418947	.3733067	3.80	0.000	.6872372	2.150657
	201005	-.6016373	2.264761	-0.27	0.791	-5.040744	3.83747
	201006	-4.341074	3.782433	-1.15	0.251	-11.75493	3.072787
	201009	13.59689	8.353062	1.63	0.104	-2.775754	29.96954
	201010	1.700541	1.520347	1.12	0.263	-1.279457	4.68054
	201011	1.382041	.4571801	3.02	0.003	.4859323	2.278149
	201012	2.914791	.1811975	16.09	0.000	2.55963	3.269952
	201101	.7658902	.4815214	1.59	0.112	-.1779289	1.709709
	201102	2.210024	.3379775	6.54	0.000	1.547562	2.872486
	201103	-.9855642	.0737306	-13.37	0.000	-1.130082	-.8410465
	201104	-1.190014	.1031457	-11.54	0.000	-1.392187	-.9878403
	201105	-2.259284	.1748801	-12.92	0.000	-2.602063	-1.916506
	201106	-6.221949	.3563201	-17.46	0.000	-6.920364	-5.523534
tme#c.cddd							
	200903	-6.000547	6.009898	-1.00	0.318	-17.78041	5.779318
	200904	9.47067	4.443481	2.13	0.033	.7611046	18.18024
	200905	.0216243	2.718661	0.01	0.994	-5.307161	5.35041
	200906	2.329244	.7958906	2.93	0.003	.7692367	3.889251
	200907	2.772365	.953149	2.91	0.004	.9041193	4.640611
	200908	-.4604952	.9606262	-0.48	0.632	-2.343397	1.422406
	200909	2.309594	.4490919	5.14	0.000	1.429339	3.189849
	200910	2.534293	1.022564	2.48	0.013	.5299885	4.538598
	200911	-2.917974	3.039127	-0.96	0.337	-8.874897	3.03895
	200912	-32.98051	31.74175	-1.04	0.299	-95.19679	29.23577
	201004	1.263395	3.050452	0.41	0.679	-4.715726	7.242517
	201005	3.867471	1.637584	2.36	0.018	.6576795	7.077262
	201006	1.980127	.5679351	3.49	0.000	.8669305	3.093324
	201007	2.133402	.7626688	2.80	0.005	.6385125	3.628292
	201008	-.5060019	.8377906	-0.60	0.546	-2.148136	1.136132
	201009	2.2436	.4318757	5.20	0.000	1.39709	3.09011
	201010	2.477164	.5175486	4.79	0.000	1.462729	3.4916
	201011	-1.452893	3.907756	-0.37	0.710	-9.112397	6.206611
	201012	1.376617	4.819154	0.29	0.775	-8.069297	10.82253
	201103	-24.70871	3.806378	-6.49	0.000	-32.1695	-17.24791
	201104	-8.552996	1.504313	-5.69	0.000	-11.50157	-5.604426
	201105	-2.017616	.7207154	-2.80	0.005	-3.430274	-.6049586

TecMarket Works

Appendices

201106		-.4422001	.2331914	-1.90	0.058	-.8992732	.0148729
tme							
200902		18.4079	13.01293	1.41	0.157	-7.098457	43.91425
200903		8.663828	16.90034	0.51	0.608	-24.46214	41.7898
200904		7.555662	8.148937	0.93	0.354	-8.416885	23.52821
200905		17.89803	15.33547	1.17	0.243	-12.16068	47.95675
200906		9.450264	11.92071	0.79	0.428	-13.91524	32.81577
200907		2.400726	15.72007	0.15	0.879	-28.41183	33.21328
200908		50.73396	15.98674	3.17	0.002	19.39871	82.06921
200909		6.523349	9.128237	0.71	0.475	-11.3687	24.4154
200910		-1.670794	10.68825	-0.16	0.876	-22.62059	19.27901
200911		5.629522	12.56396	0.45	0.654	-18.9968	30.25585
200912		-17.8968	7.15559	-2.50	0.012	-31.92231	-3.871293
201001		-22.55837	12.2463	-1.84	0.065	-46.56206	1.44533
201002		12.58432	18.07015	0.70	0.486	-22.83457	48.00321
201003		-31.38408	10.63266	-2.95	0.003	-52.22492	-10.54324
201004		-2.976105	9.501813	-0.31	0.754	-21.60039	15.64818
201005		-1.65561	13.60881	-0.12	0.903	-28.32992	25.0187
201006		11.89513	9.623149	1.24	0.216	-6.966986	30.75725
201007		12.00937	15.02349	0.80	0.424	-17.43782	41.45656
201008		62.86892	17.20099	3.65	0.000	29.15365	96.58419
201009		4.464824	9.838641	0.45	0.650	-14.81967	23.74932
201010		-5.559692	8.974723	-0.62	0.536	-23.15084	12.03146
201011		-.9713108	9.750084	-0.10	0.921	-20.08223	18.13961
201012		-25.93755	7.625283	-3.40	0.001	-40.8837	-10.99141
201101		47.2241	15.97384	2.96	0.003	15.91414	78.53406
201102		3.095165	10.67738	0.29	0.772	-17.83333	24.02366
201103		31.61035	6.877078	4.60	0.000	18.13075	45.08996
201104		26.34262	7.075866	3.72	0.000	12.47338	40.21187
201105		19.35615	7.185408	2.69	0.007	5.272195	33.44011
201106		35.12883	7.17927	4.89	0.000	21.0569	49.20075
_cons		54.73434	6.609558	8.28	0.000	41.7791	67.68959

USAGE >90kwh/day

Fixed-effects (within) regression

Group variable: acct_id

Number of obs = 25062

Number of groups = 854

F(79,24129) = 292.53

corr(u_i, Xb) = -0.0104

Prob > F = 0.0000

kwhd		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
part		-1.212488	.7943869	-1.53	0.127	-2.769536 .3445596
tme#c.hddd						
200901		1.752742	.3541156	4.95	0.000	1.058653 2.44683
200902		1.685141	.4954731	3.40	0.001	.713983 2.656299
200903		1.705155	.8983765	1.90	0.058	-.0557188 3.466029
200904		-.0289623	.3914909	-0.07	0.941	-.796309 .7383843
200905		-1.253459	1.872393	-0.67	0.503	-4.923465 2.416548
200906		11.77645	6.256459	1.88	0.060	-.4865951 24.0395
200910		-.2202095	1.171309	-0.19	0.851	-2.516048 2.075629
200911		-.0657635	1.255223	-0.05	0.958	-2.526079 2.394552
200912		3.34505	.2039282	16.40	0.000	2.945338 3.744762
201001		3.11789	.3685306	8.46	0.000	2.395547 3.840233
201002		1.617333	.7224338	2.24	0.025	.2013179 3.033349
201003		4.393179	.3718089	11.82	0.000	3.66441 5.121947
201004		1.006695	.4559925	2.21	0.027	.1129216 1.900469
201005		-4.793119	2.347874	-2.04	0.041	-9.395099 -.1911394

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Appendices



201006		-14.72063	4.060806	-3.63	0.000	-22.68006	-6.761196
201009		-9.119534	206.7221	-0.04	0.965	-414.3076	396.0686
201010		-.5156369	2.13954	-0.24	0.810	-4.709269	3.677995
201011		2.207674	.4976536	4.44	0.000	1.232242	3.183106
201012		3.558158	.2138961	16.63	0.000	3.138909	3.977408
201101		-.8752589	.505135	-1.73	0.083	-1.865355	.1148372
201102		3.149598	.3809695	8.27	0.000	2.402874	3.896322
201103		-1.251972	.0832872	-15.03	0.000	-1.415221	-1.088724
201104		-1.446295	.1074995	-13.45	0.000	-1.657	-1.235589
201105		-2.74879	.1793897	-15.32	0.000	-3.100405	-2.397175
201106		-6.100686	.332583	-18.34	0.000	-6.75257	-5.448803
tme#c.cddd							
200901		30.67107	36.03838	0.85	0.395	-39.9664	101.3085
200903		-11.14084	7.133509	-1.56	0.118	-25.12296	2.841281
200904		11.1554	4.721743	2.36	0.018	1.900489	20.41031
200905		2.051394	3.192153	0.64	0.520	-4.205425	8.308213
200906		5.358674	.8645656	6.20	0.000	3.664071	7.053276
200907		.6961586	1.098794	0.63	0.526	-1.457546	2.849863
200908		-.4573843	1.088592	-0.42	0.674	-2.591093	1.676324
200909		1.580997	.5206432	3.04	0.002	.5605034	2.60149
200910		.7615536	1.067262	0.71	0.476	-1.330347	2.853455
200911		-10.46522	3.391549	-3.09	0.002	-17.11287	-3.817574
200912		-38.74117	39.32365	-0.99	0.325	-115.818	38.33564
201004		-2.226264	3.765456	-0.59	0.554	-9.606793	5.154264
201005		4.010639	1.690475	2.37	0.018	.6972031	7.324074
201006		2.022858	.6439292	3.14	0.002	.7607169	3.285
201007		3.854143	.8505162	4.53	0.000	2.187078	5.521208
201008		-3.563497	.8716739	-4.09	0.000	-5.272033	-1.854962
201009		.8408678	.4918848	1.71	0.087	-.1232571	1.804993
201010		1.755588	.6862757	2.56	0.011	.4104448	3.100731
201011		.7741172	4.092739	0.19	0.850	-7.247906	8.796141
201012		-2.64817	5.159976	-0.51	0.608	-12.76205	7.465705
201103		-28.65353	4.640502	-6.17	0.000	-37.7492	-19.55786
201104		-5.023776	1.358325	-3.70	0.000	-7.686178	-2.361374
201105		-.7295698	.7665547	-0.95	0.341	-2.232065	.7729251
201106		.4441162	.2724364	1.63	0.103	-.0898761	.9781085
tme							
200902		5.490784	14.36569	0.38	0.702	-22.66687	33.64844
200903		-.4977723	19.9476	-0.02	0.980	-39.59632	38.60077
200904		-1.789451	9.180207	-0.19	0.845	-19.78323	16.20433
200905		-1.393019	18.04199	-0.08	0.938	-36.75644	33.97041
200906		-34.15811	13.19022	-2.59	0.010	-60.01176	-8.304464
200907		28.65697	18.08631	1.58	0.113	-6.793329	64.10726
200908		43.66203	18.12847	2.41	0.016	8.129093	79.19496
200909		9.661817	10.51051	0.92	0.358	-10.93944	30.26308
200910		1.063001	11.57326	0.09	0.927	-21.62131	23.74731
200911		.5348673	13.84965	0.04	0.969	-26.61132	27.68105
200912		-38.37856	8.157731	-4.70	0.000	-54.36822	-22.3889
201001		-28.33449	13.44489	-2.11	0.035	-54.68732	-1.981664
201002		18.04489	20.40995	0.88	0.377	-21.95989	58.04967
201003		-62.7156	12.13472	-5.17	0.000	-86.5004	-38.9308
201004		-7.17661	11.28139	-0.64	0.525	-29.28883	14.93561
201005		-1.662313	14.46243	-0.11	0.908	-30.00957	26.68495
201006		7.267884	10.87894	0.67	0.504	-14.05552	28.59129
201007		-23.98441	16.81025	-1.43	0.154	-56.93355	8.964731
201008		116.136	18.20761	6.38	0.000	80.44791	151.824
201009		20.12388	11.27882	1.78	0.074	-1.983306	42.23107
201010		-8.973489	11.10005	-0.81	0.419	-30.73029	12.78331
201011		-23.88412	10.64221	-2.24	0.025	-44.74351	-3.024731
201012		-48.08401	8.79529	-5.47	0.000	-65.32332	-30.84469
201101		97.09588	17.06901	5.69	0.000	63.63956	130.5522

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201102		-21.94418	12.14123	-1.81	0.071	-45.74175	1.853387
201103		24.23842	7.855553	3.09	0.002	8.841048	39.63579
201104		10.93865	7.965113	1.37	0.170	-4.673467	26.55077
201105		1.989546	8.147665	0.24	0.807	-13.98038	17.95948
201106		12.85553	8.187632	1.57	0.116	-3.192742	28.90379
_cons		85.46511	7.563641	11.30	0.000	70.6399	100.2903

Appendix M: DSMore Table

Total Population	8300											
Per Measure Impacts Summary for Carolinas HECR												
Impacts 	Product code	State	EM&V gross savings (kWh/unit)	EM&V gross kW (customer peak/unit)	EM&V gross kW (coincident peak/unit)	Unit of measure	Combined spillover less freeridership adjustment	EM&V net savings (kWh/unit)	EM&V net kW (customer peak/unit)	EM&V net kW (coincident peak/unit)	EM&V load shape (yes/no)	EUL (whole number)
Technology 												
Unknown												
Program wide		SC	147	N/A	N/A			147	N/A	N/A		1
Program wide - Monthly Line		SC	211	N/A	N/A			211	N/A	N/A		1
Notes: 1. Technology names should match the DSMore naming convention.												
2. Energy impacts are average per installed unit for each DSMore technology and unit description (measure/ton/sq.ft., etc.)												
3. Any analysis using a control group (such as billing analysis with a control group) does not need a freeridership adjustment (it is already in the analysis via the control group adjustment)												
4. EM&V load shape: "no" if using standard DSMore load shape for technology units, "yes" if an evaluation-provided load shape should be used for DSMore.												